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In This Issue

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Railway Expenditures and the Revival of Business

The improvement in general business which began late last summer, which was arrested in the first quarter of this year by the banking and credit situation, and which was resumed after the banking moratorium, is continuing at an accelerating rate. Freight car loadings, which were 2 per cent greater in May and 15 per cent greater in June than in 1932, were almost 30 per cent greater in the week ended on July 1 than in the corresponding week of 1932, and only 5 per cent less than in 1931. In March they were 52 per cent less than they averaged in March in the five prosperous years 1925-1929, inclusive, while in the week ended on July 1 they were only 39 per cent less than they averaged in the corresponding week of the five prosperous years.

The effects being produced upon railway gross and net earnings by the increase in traffic are very marked. In March, when the gross earnings of the Class I roads were $217,600,000, their net operating income amounted to only $10,548,000. In April, when their gross earnings increased to almost $225,000,000, their net operating income increased to over $19,000,000. In May, when their gross earnings increased further to $255,300,000, their net operating income increased to $40,700,000, or to more than twice what it was in April and almost four times what it was in March. Because of the continued increase of car loadings in June, it is probable that $55,000,000 of net operating income was earned in that month, and that total net operating income earned in the first six months of 1933 was at least $145,000,000, as compared with $112,328,400 in the first six months of 1932. Past experience indicates that if general business continues to improve at the present rate the railways will earn at least $500,000,000 net operating income in the second half of 1933, which would make the total for the year about $645,000,000, or an amount almost equal to total railway fixed charges.

Private Business Must Maintain the Revival

Many business men are asking why business is improving, and whether it will continue to improve. As the improvement actually began ten months ago, it is plain it has been mainly due to the same general economic causes which terminated all previous depressions. As it has been most rapid within recent months, it undoubtedly has been due, in considerable measure, to prospective inflation and increased buying of commodities to anticipate advances in commodity prices. Apprehension is expressed in high places in Washington lest the production of many commodities will exceed the demand for them, and that the resulting increase in inventories will be followed by declines in the production and shipment of such commodities. If this is to be avoided, the demand for raw materials and finished products must be maintained and increased by increasing the demand for both "capital goods" and "consumer goods." It is especially necessary to increase the demand for and production of "capital goods"—that is, equipment used in the production and transportation of "consumer goods,"—the decline of which was very great during the depression. The federal government's public works program is expected by its promoters largely to maintain and increase purchasing power and the demand for commodities.

The *Railway Age* is frankly skeptical regarding the extent to which general business will be either temporarily stimulated or permanently benefited by the government's public works program, or by any policy of actual inflation which it may adopt. The decline of production, commerce, earnings and employment in private business caused the depression; the decline of activity and employment in private business was many times greater than any increase in activity and employment that will or can be caused by expenditures upon public works; the taxes for paying for public works must all be derived, directly and indirectly, from private business, and, therefore, only a general revival of private business will substantially relieve unemployment, restore prosperity and provide the means for paying for public works. The real problem of continuing the restoration of prosperity is consequently the problem of finding and adopting means that will increase production, commerce and employment in private business. Regardless of what the government may do in the administration of the industrial recovery and public works legislation, the business men of the country will have to find and adopt, in the conduct of their own businesses, the means of maintaining and stimulating the increase in industrial and commercial activity now occurring. The government can help or hinder, but government direction and action can never, until a

complete policy of socialism has been adopted, serve as a substitute for private initiative and enterprise.

The Need of Increased Railway Expenditures

As the student of economics and business in their broader aspects surveys the developments that have been occurring, he can hardly fail to be inpressed by the fact that the nation's great railroad industry has thus far contributed almost nothing to economic recovery, except by satisfactorily handling an increasing volume of traffic. It has often been said that the railways are directly and indirectly such large employers of labor and purchasers of raw materials and manufactured products that normal employing and purchasing by them is necessary to the maintenance or restoration of prosperity. If this is not true, the economic importance of the railways has been exaggerated. If it is true, it will soon be necessary for the railways largely to increase their employment and purchases if the improvement in business now occurring is to continue. We believe that the latter is the correct view of the matter. The expenditures of the railways for improvements and maintenance in 1932 were $1,800,000,000 less than in 1929—an annual decline in the expenditures of a single industry one-half as great as the entire projected public works program of the government. It is essential to the restoration of prosperity that increases of employment and buying shall be well-balanced—that all important industries shall contribute to them proportionately. Therefore, the improvement of general business can hardly fail to slacken unless it is soon supported by a substantial increase of railroad employment and buying and, as the railroads probably are benefiting more than any other industry by the improvement now occurring, they would be hurt more by a slackening of it than any other industry.

Differing Conditions of Railways

The increases in their gross earnings and net operating income that are occurring would normally bring the railways back into the market as larger employers and buyers in a comparatively short time, and it is only natural that meantime the managements of many of them should still be severely restricting their expenditures for maintenance to avoid increases in operating expenses that would limit the increases in net operating income they must get in order to meet their fixed charges. But the financial situation of all railways is not the same. Some already are making earnings largely in excess of their fixed charges and others soon will be. In view of the lack of uniformity in financial results there could be no economic justification for continuance of a virtually uniform policy of retrenchment.

Increases in railway employment and buying are greatly needed to help maintain and stimulate the improvement in general business already under way, and the continuance of unnecessary retrenchments to make "paper" financial showings could be justly criticised. It seems plain that it would be not only in the public interest, but in their own selfish interest, for railways that already are earning substantially more than their fixed charges to begin immediately to increase their employment and purchases as much as they reasonably can, and for others to do likewise as rapidly as they become able. It usually has been the practice in past depressions for virtually all the railways to delay increasing their employment and buying until about the same time, and then to rush into the markets together, with the result of congesting manufacturing plants, increasing manufacturing costs, making prompt deliveries impossible, and bidding up prices unnecessarily. The railroads that take the lead in increasing the buying of equipment and supplies will get the benefit of lower prices than will prevail later.

Public Works and Loans to Railways

Probably there are numerous railways which will be unable for some months substantially to increase their employment and buying by means of their increased earnings and the improved credit which increased earnings will gradually create. It is understood that the government is willing to loan money to the railways with which to do needed improvement and maintenance work, and unquestionably the effects produced upon general business, both in the near future and in the long run by the loaning of money to the railways on easy terms and their expenditure of it, would be better than the effects of the expenditure of an equal amount upon public works of dubious economic necessity and value. Unfortunately, the government's policies of expenditures upon public works, and of making loans to the railways, are highly inconsistent. When the government makes expenditures upon a highway, a building, a waterway or any other kind of public works, it does not arbitrarily reduce and limit the salaries or profits of the contractors or manufacturers to whom it gives the business. On the other hand, the Reconstruction Finance Corporation has imposed a requirement that the salaries of officers of railways to which it makes loans must be arbitrarily reduced to amounts specified by it. Whether railways that might borrow under the public works legislation would be obliged similarly to reduce the salaries of their officers is uncertain. At any rate, it does not change human nature for a man to get a salary instead of wages, and if government officials cannot see that, by penalizing railway officials with reductions of their salaries for borrowing government money they will reduce any inclination railway managements may have to borrow and spend government money, they must have a peculiar form of blindness. The stimulation of needed railway expenditures for labor, equipment and materials by loans of public money would be one of the most effective means the government could adopt to maintain and stimulate the increase in general business, but if the government wants the railways to aid it all they can in reviving business, it should show a willingness to make loans to them on easier and more acceptable terms than it has yet offered.

Scientific Cut-Off Control Improves Locomotive Performance

Systematic instruction in use of Valve Pilot indications produces uniformly high standard of locomotive operation with 10 per cent saving in fuel

By J. L. Davidson,
Mechanical Engineer, Valve Pilot Corporation

SINCE the building of the first steam locomotive in this country over 100 years ago the efforts toward improvement have been largely directed to increasing the power of each succeeding design. The weight on drivers has increased from 2½ tons per pair in 1833 to more than 30 tons per pair in 1933 and during the same period tractive force has increased from 1,100 lb. to upwards of 100,000 lb. on single-expansion locomotives. Boiler pressures have similarly increased from 60 lb. to 300 lb. Many refinements have been developed during this period some of which actually increase the tractive force of the locomotive, while others enable the production of the same power output with substantial reductions in fuel and water consumption.

During the greater part of this period of development it was known that the greatest economy in locomotive operation is attained by taking advantage of the expansive force of the steam by the use of the short cut-off and the great difference in fuel consumption between that required by the use of partial throttle and long cut-off and that needed when operating with full throttle and short cut-off was universally recognized. To permit changes in cut-off while running, power reverse gears were devised which obviated the limitations encountered with the earlier type of manually operated reverse lever. While both the reverse lever and the power reverse gears were intended to enable the engineman to change the point of cut-off, nothing was provided to show him what particular point of cut-off should be used from time to time to suit the varying conditions of railroad operation.

Engineman Needs Guide to Efficient Steam Utilization

Dynamometer tests have demonstrated that there is a particular point of cut-off which, at each particular speed, will produce maximum tractive force and that there is another point of cut-off for each particular speed, load and grade which will produce maximum fuel economy. Such laboratory demonstrations and deductions cannot be applied by the unaided engineman in every-day operation. While every effort has been made to teach the theory to the enginemen and to demonstrate it to them in practice, yet as a whole they have been and continue to be able, without a guide, to achieve in regular service efficient or economical operation comparable with results produced during tests. The most perfect design of a locomotive cannot insure efficient results where maximum capacity is demanded or economy where economy is desirable unless the operator is given a scientific guide to enable him most effectively to use the steam which has been produced.

This guide to more efficient utilization of steam is now available through the indications of the Loco Valve Pilot which enables the engineman, by reverse-lever changes, to equate drawbar pull to train resistance under the varying conditions of load, grade and speed. The Valve Pilot simply combines in one instrument the functions of a speed indicator and recorder with those of a cut-off indicator and recorder, the cut-off being indicated in terms of speed.

Without going into further details regarding the mechanical construction of the Valve Pilot, let us follow the history of its use on 4-6-4 type locomotives in passenger-train service on a railroad which in 1928 began with an initial application of five. This represented less than six per cent of the total number of locomotives of the class in passenger service. The locomotives equipped operated in a pool and were handled by a large number of enginemen. No attempt was made at first to instruct all passenger enginemen systematically in the proper use of the equipment because the same man had a Valve-Pilot engine at infrequent intervals only. However, the tape records for this period afforded an excellent opportunity to study the methods used by different enginemen in the selection of cut-off when guided by their judgment and previous experience alone.

The performance records produced by the recording mechanism of the Valve Pilot were forwarded to the office of the fuel department for analysis and classification by operating divisions. From these first records four typical methods of operation respecting the selection

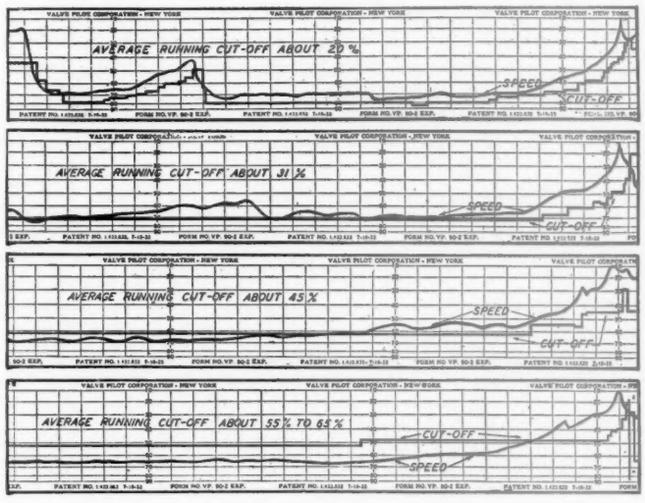


Fig. 1—Sections of Valve Pilot Tape Records Illustrating the Four Grades of Operation—Grade A at the Top to Grade D at the Bottom

of cut-off at running speed were established as a measuring stick of locomotive operation. These were designated as Grades *A*, *B*, *C* and *D* in the order of the quality of performance. The following tabulation expresses the various grades of operation in terms of per cent running cut-off:

Grade	Running cut-off, per cent	Designation of quality of performance
A	Less than 30	Good
B	30 to 35	
C	36 to 50	Poor
D	More than 50	

The four sections of performance records reproduced in Fig. 1 are illustrative of the four grades of operation selected. Grade *A* shows the type of performance resulting from closely following Valve-Pilot indications. Grade *B* shows that the engineman did not follow Valve-Pilot indications so closely, but produced a fair grade of performance. Grades *C* and *D* are typical of long-cut-off, partial-throttle operation.

Even though these selections were made largely on the basis of economy, it was found that while the Grade *A* engineman operated with economy he also made better use of the reverse lever in accelerating from stops and slow-downs, thus tending to return his train to running speed in the shortest possible time.

The early analyses of the performance records showed very clearly that the selection of cut-off at running speed was based largely on the judgment of the enginemen rather than on train load, weather or the condition of the locomotive. The records of runs of the same locomotive on two or more divisions with the same train indicated a wide variation in the methods of operation. When following up the movements of individual locomotives with different enginemen under various conditions of load, schedule and weather it appeared that no two enginemen operated the engine alike under similar conditions.

A card record was kept of each engineman operating locomotives equipped with the Valve Pilot and from these records it was noted that, regardless of train load or other conditions, *C* and *D* operations were made by men who were consistent in these types of operation and that the men who ran with short running cut-off were consistent in the *A* and *B* types of operation. The card records further revealed that a number of enginemen who, previous to receiving instruction, had turned in *C* and *D* records consistently registered *A* and *B* performance after instruction.

With this ground work accomplished the problem resolved itself into one of concentrating on those men using long cut-off to raise the standard of their performance to the Grade *A* class. This was the objective of a campaign of instruction which began in the summer of 1931.

To measure the rate of improvement in locomotive operation as a result of this campaign, monthly analyses of locomotive performance as reflected by the Valve-Pilot autographic tape records were made by divisions and forwarded to the motive-power officers of each division. In addition to this, poor performance records were promptly sent to the officer concerned and the men who made these records were interviewed and given special instruction in operation according to Valve-Pilot indications. The early analysis and report covering a preliminary survey from August, 1930, to February, 1931, is reproduced in Table I, which also includes the report for the month of April, 1933, the latter being similarly compiled.

The most interesting feature of this comparison is the remarkable improvement in locomotive operation on Division No. 3 wherein 32.8 per cent of *C* operations and 37.1 per cent of *D* operations were raised to Grades *A* and *B* levels, increasing the number of *A* operations from 4.3 per cent to 87.5 per cent and completely wiping out the *D* operations. This means that in April, 1933, 87.5 per cent of passenger locomotive operations on this division were accomplished by the use of an average running cut-off of less than 30 per cent.

The improvement in the quality of operation on other divisions paralleled to a lesser degree that of Division No. 3 and, as a result, the quality of operation on the railroad as a unit was raised to a much higher standard.

Table I—Comparison of the Summary of Locomotive Operation as Determined by the Loco Valve Pilot

August, 1930, through February, 1931, with April, 1933

Division	Period	*A* less than 30 %	*B* 30 to 35 %	*C* 36 to 50 %	*D* More than 50 %	"Good"[1] *A+B*, %	"Poor"[2] *C+D*, %	No. of records
No. 1	8/30—2/31	6.1	19.0	37.6	37.3	25.1	74.9	263
	April, 1933	73.5	24.4	2.0	0.1	97.9	2.1	1,084
No. 2	8/30—2/31	16.4	28.6	31.6	23.4	45.0	55.0	269
	April, 1933	71.4	27.3	1.1	0.2	98.7	1.3	1,009
No. 3	8/30—2/31	4.3	25.0	33.6	37.1	29.3	70.7	232
	April, 1933	87.5	11.5	1.0	0.0	99.0	1.0	883
No. 4	8/30—2/31	14.2	27.8	37.6	20.4	42.0	58.0	162
	April, 1933	89.2	10.3	0.5	0.0	99.5	0.5	685
Others[3]	8/30—2/31	16.7	30.8	42.3	10.2	47.5	52.5	78
	April, 1933	79.9	19.5	0.6	0.0	99.4	0.6	1,442
All	8/30—2/31	10.6	23.3	35.4	28.7	35.9	64.1	1,004
	April, 1933	79.4	19.5	1.0	0.1	98.9	1.1	5,103

[1]"Good" equals *A* plus *B*.
[2]"Poor" equals *C* plus *D*.
[3]This group includes four divisions.

C and *D* operations were practically reduced to zero, *B* operations were slightly reduced and Grade *A* operations were increased from 10.6 per cent to 79.4 per cent.

To better illustrate the trend in locomotive performance the monthly reports were reduced to graphic form and distributed among the general and divisional operating and mechanical officers. Fig. 2 is such a graphic picture of the locomotive performance on Division No. 3 from March, 1931, to April, 1933, inclusive.

It is interesting to note that in March, 1931, the number of "poor" operations were almost twice the number of "good" operations, in the proportion of 65.5 per cent to 34.4 per cent. This state of affairs continued until

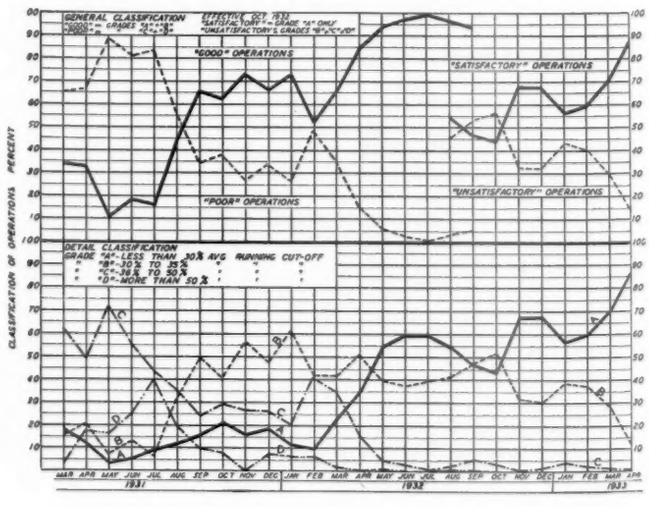


Fig. 2—How the Valve Pilot Tape Records Graded on Division No. 3 from March, 1931, to April, 1933

August, 1931, at which time a sudden rise in "good" operations is noted from 16.2 per cent to 44 per cent, due to the fact that in the latter part of July, or early in August, systematic education in the use of the Valve Pilot was begun. From that point the trend was generally upward, reaching a comparatively stable level of about 65 per cent "good" during a period of several months, the trend of the curve during the period having been governed by the Grade *B* operations. A sudden drop in "good" operations in February, 1932, indicated the necessity for concentrating educational efforts upon the enginemen in the *B* and *C* grades. The results of these efforts are reflected in the steady upward trend of the curve to July, 1932, reaching 99.5 per cent at that time.

In comparing the record of this division with those of other divisions it was noted that it was maintaining its high standard of "good" operations largely upon the Grade *B* operations.

When the "good" operations, based upon the method of rating prevailing at the time, reached practically the point of perfection in July, 1932, it was noted that the Grade *B* performances amounted to approximately 40 per cent of the total. Assuming that the Grade *A* operations remained constant at 59 per cent to 60 per cent, any raising of Grade *B* operations to the Grade *A* level would not be reflected in an added improvement to the standing of the division as a whole. This had a tendency to lessen the incentive still further to improve the performance by attempting to lift at least a substantial portion of the Grade *B* operations to the Grade *A* level. It is not possible to credit the division with more than 100 per cent "good" performances and yet with 40 per cent of *B* operations it was believed that there was ample opportunity to improve the efficiency, provided some method of rating were established which would give due credit for raising the Grade *B* operations to the Grade *A* level.

Accordingly, beginning with the month of October, 1932, Grade *A* operations were, and still are, classified as "satisfactory" performances and Grade *B* operations were placed in the lower bracket with Grades *C* and *D*, all of which were classified as "unsatisfactory."

By the end of April, 1933, the reaction toward raising the standard of efficiency resulted in lifting about 29 per cent additional Grade *B* operations to the Grade *A* or "satisfactory" level, making a total of 87.5 per cent such operations compared with 43 per cent in

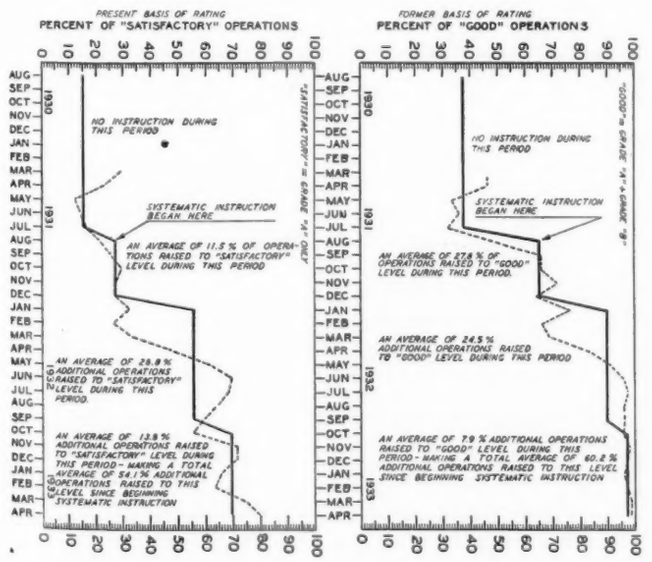


Fig. 3—The Upward Trend in Efficiency of Locomotive Operation as Indicated by the Grading of Tape Records

October, 1932. What is true of this division applies generally to the railroad as a whole.

Fig. 3 presents an interesting picture of the upward trend in efficiency of locomotive operation on the railroad as a unit for the period as far back as records are available. The analysis of the records, using both the former and the present basis of evaluating the degree of efficiency, naturally divides itself into a group of cycles suggested by the salient features of the study. Averages of performance for each of these cycles have been taken in order more clearly to define the trend of the month-by-month curve. The principal features of the analysis are noted on the graphs and will not be discussed in detail.

One of the outstanding features of the analysis is the clear delineation of progressive improvement in the quality of locomotive operation subsequent to the initiation of a plan of systematic instruction of the enginemen in the use of the Valve Pilot as a guide to the selection of cut-off. The rate of improvement has been maintained in spite of an increase in the number of Valve-Pilot-equipped locomotives from 5 to 94 and in the number of autographic performance records from 200 per month to 5,000 per month.

The record of "satisfactory" operations wavered somewhat during the period between June, 1932, and February, 1933, but this was largely due to the enginemen varying back and forth across the border line between *A* and *B* performances and to an increasing number of enginemen each month being required to familiarize themselves with the proper use of the Valve Pilot. Then, too, prior to October, 1932, when the method of rating was changed, the enginemen knew their quality of performance would not be subjected to criticism as long as it was maintained at the *B* level.

The recessions in the performance curve demonstrate the desirability and value of autographic records and of a systematic analysis of them, with a view toward keeping the quality of locomotive performance at a consistently high level. The individual records identify the enginemen responsible for the recession and the monthly analysis shows the trend. From the records of individual enginemen it is possible to segregate the consistently "unsatisfactory" performances and concentrate all educational efforts on them. The result of such concentrated effort is indicated by the upward swing of the curve from February to April, 1933, which followed conferences between the superintendent of fuel and locomotive performance and road foremen of engines for the specific purpose of lifting more men to the *A* level of operation.

The autographic records thus serve a three-fold purpose: They point out the men who fall below par; they verify and commend the operation of the men who maintain a high standard of performance, and they report the progress attained by the men who have received instruction. Thus are the road foremen of engines better enabled to make the most effective use of their time by directing their efforts toward those men who are most in need of instruction.

While the graphic analyses shown in Figs. 2 and 3 very clearly depict in chronological sequence the progressive improvement in locomotive operation resulting from the use of correct cut-off, they do not offer a means of quick comparison to answer the question "How much better have we done this year over the corresponding period a year ago?"

To answer this question graphic analyses showing the comparative quality of performance on each division were prepared, comparing the period from October,

1931, to and including April, 1932, with the corresponding period twelve months later. Fig. 4 illustrates the comparative performance on Division No. 3 which is typical of the other divisions and of the railroad as a whole. Here, again, the salient features of the analyses have been noted on the charts.

It is interesting to observe that the average of the "good" performance of Division No. 3 for the current seven months equals that of the railroad as a unit, but the per cent of "unsatisfactory" operation is not quite so good. However, the sharp upward slope of the curve of "satisfactory" performance on the division indicates that it is on its way toward a level well above the average.

The raising of the standard of locomotive performance, as shown on the various graphs, is interesting indeed, but what does it mean in fuel economy to lift an operation from a lower to a higher level? What is the

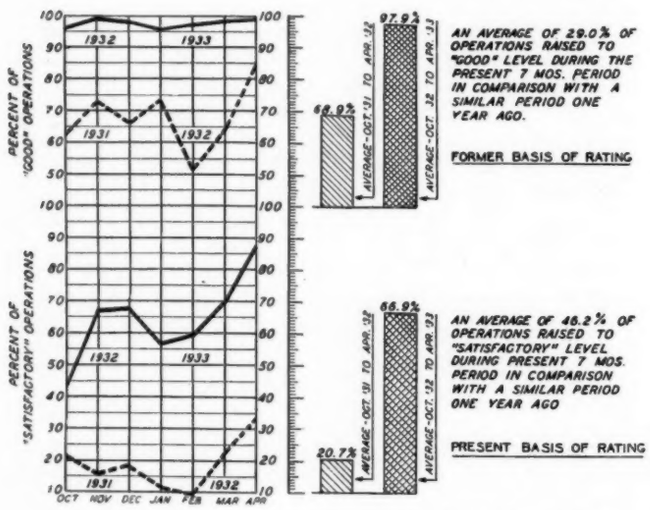


Fig. 4—A Comparison of Corresponding Periods by Years

tangible benefit derived from making a Grade *A* man out of a consistent Grade *C* operator, say, on Division No. 3?

In September, 1931, the railroad found the answer to these question in the results of observations made with a locomotive equipped with Valve Pilot and a coal meter for measuring fuel consumption. On the first trip the locomotive was operated with an average running cut-off of 45 per cent (Grade *C*) and the speed controlled by the throttle. On the second trip with the same number of cars an average running cut-off of 27 per cent (Grade *A*) with full throttle was used. The results are pictured in Table II.

Table II—Comparative Fuel Performance of a 4-6-4 Type Locomotive Operated with 45 Per Cent and 27 Per Cent Average Running Cut-Off.

Station—from and to	M to N		N to O		M to O	
Avg. running cut-off, per cent	45	27	45	27	45	27
Distance, miles	67.5		78.8		146.3	
No. of cars	13 Pullman		13 Pullman		13 Pullman	
Passenger—Car Miles	877.5		1024.4		1901.9	
Total coal, lb.	6616	5639	8250	6857	14,866	12,496
Coal difference, lb.		977		1393		2370
Lb. coal per p. c. m.	7.54	6.43	8.05	6.69	7.82	6.57
Saving, lb. coal per p. c. m.		1.11		1.36		1.25
Lb. coal per loco. mile	98.0	83.5	104.7	87.0	101.6	85.4
Saving, lb. coal per loco. mile		14.5		17.7		16.2

Locomotive equipped with coal meter and Valve Pilot.

Therefore, if an engineman produces Grade *C* operation and another Grade *A* operation, the former is using 19 per cent more fuel than the latter. Conversely, the Grade *A* operator, by following the indications of a scientific instrument, uses 15.9 per cent less fuel than the *C* operator.

Any device applied to a locomotive must be justified by improved operating efficiency which can be tangibly measured in dollars and cents. In order to evaluate the savings effected by improved locomotive performance a further study was made of the fuel consumed over a given section of the railroad by both Valve-Pilot and non-Valve-Pilot locomotives handling similar trains. The study covered about 12,000 miles of operation by Valve-Pilot indication and some 29,000 miles without the Valve Pilot. The coal consumption was taken from the original coal disbursement reports at a coaling station 254 miles from the initial terminal and, for purposes of the study, this point was considered the end of the run. Coal disbursements to the locomotives on all of the trains but one were made and the weight estimated by the same operator.

Table III—Summary of Fuel Performance Observations—4-6-4 Type Locomotives with and without Valve Pilot

Train	With or without Valve Pilot	No. of runs	Avg. cars per train	Total miles: Loco.	Total miles: Pass. car	Total coal fired tons	Coal fired, lb.: Per loco.-mile	Coal fired, lb.: Per pass.-car-mile
A	Without	4	16.3	1017.6	16522	60	117.2	7.26
	With	4	16.3	1017.6	16522	53	104.1	6.41
	Saving, per cent	...	...	....	....	...	11.1	11.6
B	Without	3	11.3	763.2	8649	34	89.1	7.86
	With	3	11.3	763.2	8649	30	78.6	6.93
	Saving, per cent	...	...	....	....	...	11.7	11.8
C	Without	8	14.25	2035.2	28761	112	110.05	7.78
	With	6	14.20	1526.4	21736	77	100.89	7.08
	Saving, per cent	...	...	....	....	...	8.3	8.9
D	Without	4	14.0	1017.6	14245	55	108.09	7.72
	With	4	14.1	1017.6	14310	48	94.32	6.70
	Saving, per cent	...	...	....	....	...	12.7	13.2
E	Without	3	15.4	763.2	11736	46	120.5	7.83
	With	3	15.35	763.2	11718	42	110.0	7.16
	Saving, per cent	...	...	....	....	...	8.7	7.2
Avg. of group	Without	22	14.3	5596.8	79913	307	109.70	7.67
	With	20	14.35	5088.0	72935	250	98.27	6.85
	Saving, per cent	...	...	....	....	...	10.4	10.6
Avg. all runs	Without	115	13.24	29256	387349	1524	104.18	7.87
	With	47	12.77	11956	152678	540	90.33	7.07
	Saving, per cent	...	...	....	....	...	13.3	10.01

The results are shown in Table III. They are grouped according to trains and an average taken. At the bottom of the table are shown the results obtained by taking an average of all the runs which included some not grouped in the first classification. It will be noted that the savings due to Valve-Pilot operation vary from 8.3 per cent to 12.7 per cent on the locomotive-mile basis and from 7.2 per cent to 13.2 per cent on the basis of fuel consumed per passenger-car-mile, when considering the performance of individual trains. The average saving for all of the grouped runs is 10.4 per cent of fuel per locomotive-mile, or 10.6 per cent of fuel per passenger car-mile.

Applying fuel savings of such magnitude to railroad operating costs demonstrates that the result of improved locomotive operation more than amply repays the time and effort involved in its attainment.

THE GERMAN RAILWAY ADMINISTRATION has decided upon extensive replacements of steam-powered units with Diesel-electric locomotives, according to recent reports received by the U. S. Department of Commerce. Ten Diesel locomotives formerly equipped with 75-h.p. engines are now being fitted with 150-h.p. units and in addition, ten new 150-h.p. locomotives with Diesel-electric driving apparatus have been ordered.

Energizing the Supply Dollar

Prize winning paper points out economies for railroads through elimination of waste in stores operation*

By A. G. Follette
General Material Supervisor, Pennsylvania, Philadelphia, Pa.

EFFICIENCY in the operation of material supply is always important, but at a time when there is a shortage of both revenue and credit, it is doubly essential that the supply dollar be re-energized and made to do extraordinary work. This may be accomplished by speeding up turnover, making every possible use of material already on hand, cutting out waste motion in handling materials, eliminating waste time in the processes of ordering and procuring them, and by releasing usable material from unused equipment and facilities and repairing second-hand material, rather than procuring new.

Accurate Knowledge of Requirements Essential

The rate of monthly turnover, as taken from the material balance sheet, is represented by a fraction, the numerator of which is the value of material charged to expenses while the denominator is the total value of material on hand. If that denominator is inflated with oversupply, the obsolete, and the useless, the turnover percentage is affected adversely. Unfortunately, there is no way to remedy such a condition, once it exists, except by selling the material, by utilizing it for new construction, or by charging it against expenses. Any service loss sustained in any of these operations is a debit against the net earnings of the railroad served. Much can be done to prevent the existence of this condition by obtaining an accurate knowledge of the requirements of the using departments, and by a closer adherence to the principles of standardization and simplification in purchasing, whether it be for stock, repairs, construction work or for any other purpose.

There are many items of material of a standard and active nature and of comparatively small unit value, where the stock may not be drastically reduced for fear of detriment to the service, and where, if the stock should become temporarily high, the condition can be corrected quickly by slowing up purchases. The above well-known fact is a most convincing argument in favor of simplification. Let us not spend too much time in trying to liquidate that which is self-liquidating.

Slow-Moving Material

It is the slow-moving material of high unit value which most seriously retards turnover and which should receive the most concentrated supervision, lest it be ordered unnecessarily or delivered too far in advance of requirements. This is especially important in connection with new construction or process repair programs. In such cases, any change in plans may delay the use of the material, and any cessation of the work for financial or other reasons may tie up large sums of money in material for an indefinite period. While much progress has undoubtedly been made in the solution of this problem, conditions are still far from satisfactory. The functions of the officer who holds the financial strings, of the engineer who schedules the work, and of the department which furnishes the material must be more closely co-ordinated before we can eliminate this source of waste.

When a surplus of this slow-moving material is found to exist, steps should be taken immediately toward its disposal. Bearing in mind that any service loss sustained in liquidation must be a charge against expenses and a debit to net earnings, it is obvious that liquidation should be made in a way that will entail the least service loss. In many items of material, there is a variety of possible substitutions. This is especially true of electrical, telegraph and signal supplies, such as wire and cable, conduit fittings, motors, transformers, relays, rectifiers and other items. This is also true of pipe

* One of two papers awarded prizes in the annual competition conducted by the Purchases and Stores Division of the American Railway Association.

Stationery Storehouse on the Katy

fittings and miscellaneous building fixtures and supplies. In some cases it may be necessary to make some modification to suit the conditions under which they are to be used. The service loss will be measured by the cost of modification, but the dollar tied up in material so treated will be put to work rather than lie idle while additional dollars are spent for new material. Substitutions should be made only with the approval of the proper officer in the department using the material. Close and harmonious contact with the using departments is essential to the success of the foregoing procedure. This contact serves the double purpose of solving immediate problems and of inducing greater care on the user's part in ascertaining actual requirements before ordering material.

Material of the above character should be concentrated at a central store. It should be systematically arranged so that substitutions may be made intelligently without needless hunting about for the particular item desired. Every requisition for similar material should be checked against the surplus before purchasing additional material.

Material for which there is no prospective use should, if possible, be sold. In this connection, it seems unfortunate that so little advancement has been made in the exchange of material between railroads. They are hampered by common restraints of operation, and are faced with outside competition which is common to all. They are already co-operating in other phases of operation. Why not get together in the purchasing of supplies and in the sale of surplus material?

The introduction of labor-saving devices, the construction of modern storehouses and the proper location and arrangement of stores stock have done much to reduce the expense of handling material. Possibilities of further improvement are by no means exhausted, particularly in the location and arrangement of stock. We have in mind a distributing store which fell behind in filling orders, supposedly because of a necessary curtailment of force. A study was made of the stock arrangement and its relation to the work of the stores forces. As a result, the stock was rearranged on the principle that the most active items should be the most easily accessible and the nearest to the shipping counters. Temporary assistance was given the storekeeper to complete unfilled orders. Thereafter he was able to keep up to date with his reduced force. Eliminating wasted steps in the storehouse increases the output of the supply dollar.

Faster Delivery

One of the most important problems of the material supply service is to determine how to shorten the period between the placing of orders by the storekeeper and the delivery of the material. Herein lies one of the greatest opportunities for both the purchasing and stores departments to increase the net earnings of their road. It applies with special force to those items of active material which were previously styled as "self-liquidating." We may think that the stock of such items has already been reduced to a minimum consistent with efficient service; but if we shorten the processes of ordering and purchasing, it will be found practicable to reduce the stock still further.

The release order is a means now used by some railroads to accomplish quick delivery. The purchasing agent, on information furnished by the general storekeeper, arranges with the vendors to furnish material at the different storehouses, giving them the complete description and identifying number for each item to be furnished. Shipment is made, however, only as released by the storekeeper or ordering stockman. The release is made on a form provided for the purpose, giving the identifying number and a brief description of each item. It is forwarded to the vendor through the general storekeeper, who is thus given an opportunity to supervise the quantities released. The method has several advantages. Time is saved in writing orders, since only a brief description, with the reference number as the principal means of identification, is necessary. Time ordinarily required by the purchasing department in placing orders is eliminated, since the release order by-passes that department. The vendor has better information regarding the approximate quantities to be furnished over a given period and is thus able to control production or stock more in accordance with demand, and therefore able to ship goods more promptly.

For classes of material to which the foregoing method is not applicable, the procedure in the offices of the general storekeeper and the purchasing agent should be so systematized and supervised that requisitions will be put through the process in a minimum of time. Each requisition should be scrutinized as to quantity and checked as to the necessity for purchasing. It should not, however, be allowed to lie around, but should be acted on promptly. Every day that is eliminated from the process of ordering, purchasing and shipping is a distinct saving of waste.

Using Left-Over Materials

Many railroads are now finding it possible to discontinue the operation of certain shops, enginehouses, interlocking stations, or water stations. When there is no longer any use for such facilities, the usable equipment and material should be released for use at other points. If existing accounting rules and regulations prohibit their release without the entire facility being written out of capital account, the rules should be modified so that the supply dollars so tied up may be put to work. Usable material made available in this way should be forwarded promptly to a central storehouse where it will be ready for the filling of requisitions. As new construction work progresses, tools and left-over materials should be returned to the storehouse as soon as they can be dispensed with—not after the project is completed. The foregoing procedure, intelligently and energetically followed, will save thousands of dollars in the purchase of new material.

Reclamation and repair are more advantageous during business inactivity than at other times. They will save the outlay for new materials when money is scarce. They will give employment to workmen who would otherwise be idle and thus help to keep up the morale of working forces.

In times of prosperity, railroads may be able to produce and sell transportation at a profit, even though efficiency of management and of operation be not of the best. When business is slack, it takes real management and everlasting vigilance to show a profit. When there is a shortage of revenue, corresponding savings must be sought within. Material supply service is one of those inside functions wherein lies great opportunities for saving. It is not sufficient merely to curtail working forces or make substantial reductions in the material stock balance. There must be thorough and continuous study of material supply service in all its ramifications to eliminate those conditions which foster over-supply, obsolescence, deterioration, and waste in all its forms. In the expenditures for materials and supplies and for service incidental thereto, it will be necessary, where it is at all possible, to make one dollar so invested perform the work of two. This is the principle of energizing the supply dollar.

Co-ordinator Organizes For Work

Washington units on freight service, pooling purchases, and research supplemented by regional groups

WASHINGTON, D. C.

JOSEPH B. EASTMAN, federal co-ordinator of transportation, on July 10 announced his initial organization, including three sections to be located at Washington dealing with freight service, car pooling, and purchases, regional directors and traffic assistants for the eastern, western and southern regions, and an executive and research staff at Washington. He also announced a conference to be held at Washington on Friday, July 14, with the three regional co-ordinating committees named by the carriers. The announcement was made following a conference at the White House on July 6 because the law creating the office of co-ordinator requires the approval of the President for his appointments. This does not complete the organization and other announcements will later be made.

In a statement outlining the functions of the new organization and some of the methods to be followed Mr. Eastman pointed out that under the law the co-ordinator must in the first instance work with the three carriers' committees and he cannot issue orders until matters have been referred to them and they have either made recommendations or have failed to act. The following have agreed to accept service in the co-ordinator's organization:

Director, Section of Freight Service, J. R. Turney, St. Louis, Mo.

Director, Section of Car Pooling, O. C. Castle, Houston, Texas.

Director, Section of Purchases, R. L. Lockwood, Washington, D. C.

Eastern Regional Director, H. J. German, Pittsburgh, Pa.

Western Regional Director, V. V. Boatner, Chicago, Ill.

Southern Regional Director, C. E. Weaver, Savannah, Ga.

Eastern Traffic Assistant, W. H. Chandler, New York, N. Y.

Western Traffic Assistant, C. E. Hochstedler, Chicago, Ill.

Southern Traffic Assistant, M. M. Caskie, Mobile, Ala.

Executive and Legal Assistant, J. W. Carmalt, Washington, D. C.

Executive Assistant, J. L. Rogers, Washington, D. C.

Research Staff, O. S. Beyer, Washington, D. C.

Research Staff, Leslie Craven, Durham, N. C.

Research Staff, W. B. Poland, New York, N. Y.

Research Staff, F. W. Powell, Washington, D. C.

The statement follows:

The Emergency Railroad Transportation Act, 1933, contemplates that the railroads and the Federal Co-ordinator of Transportation will work together in searching out economies in railroad operation and management which are practicable and desirable and have not yet been realized. It is directed particularly at whatever wastes are caused by lack of effective co-operation of the railroads with each other, and in the expectation that the Federal Co-ordinator can bring about greater unity of purpose and action.

The railroad activities will center in the three Regional Co-ordinating Committees, composed of executives in the East, West, and South, and under the Act it is the duty of the Federal Co-ordinator in the first instance to work with these committees, although he has ultimate power to act independently.

So far as the Co-ordinator's own organization is concerned, he will deal with certain matters through units or sections located at Washington. One of these units will be called the Section of Freight Service. It will deal with the modernization of freight service to meet the changed conditions brought about by the competition with the railroads of motor trucks and other transportation agencies. Especially it will deal with the methods of handling less-than-carload freight, including the utilization of containers, demountable truck bodies, and similar new types of equipment, reduction in weight of equipment, the problem presented by the car-forwarding companies, the relation of the Railway Express Agency to the situation, store-door delivery, and the use of motor trucks as auxiliaries to or substitutes for rail service, particularly in terminal areas.

It is probable that a similar unit will be created to deal with passenger service and its improvement, or that the two will be combined under one head.

Another unit will be called the Section of Purchases. It will deal with such matters as the standardization of materials and supplies, and also equipment, and with simplified practice and improvement in purchasing methods generally.

A further unit will be called the Section of Car Pooling. It will consider whether it is feasible and desirable to extend the principle of pooling to all or any kind of equipment, and will also consider other means of reducing empty-car mileage or improving car-repair practices, including the question of car rentals.

Questions relating to allowances, direct or indirect, to shippers for various services, and also those relating to so-called accessorial services which the railroads perform, and to the charges therefor, will be dealt with chiefly through the Bureau of Service of the Commission.

There are various other matters which will be handled centrally as the work of the Co-ordinator develops.

Regional Organizations

In addition to this central organization, however, the Co-ordinator will have regional organizations paralleling the carriers' Regional Co-ordinating Committees. At the head of each will be a regional director with much experience in railroad operation, and under him there may be specialists in particular phases of operation, such as repair of equipment, maintenance of way, and terminal operations, and also certain district representatives, more especially in the western region. Associated with him will be a man experienced in the traffic problems of shippers, who will supply this point of view to the organization and provide a point of contact for shippers.

It will be the duty of these regional subdivisions of the Co-ordinator's organization to maintain contact with the carriers' Regional Co-ordinating Committees, to help the Co-ordinator select matters to refer to those committees for study, and to check up for him the adequacy and reliability of the investigations which are conducted by or through those committees. At times the regional directors may find it necessary to conduct certain investigations on their own account, and in such instances it is expected that arrangements can be made to supplement their forces, when necessary, through employees of the carriers loaned temporarily for detailed work.

The matters for investigation which will fall within the province of these regional directors of the Co-ordinator will include the unification of terminal operations, the joint use of shops and various other facilities, the pooling of train service, and the elimination of uneconomical routes. These are, of course, illustrations, not intended to exhaust the possibilities.

Research Staff

Besides that part of his organization, above described, which will deal with possible economies in railroad management and operation, the Co-ordinator will have a separate staff to help him with the research necessary in arriving at the recommendations for further legislation of a more permanent character which it will be his duty to submit through the Commission to the President and to Congress, for the purpose of improving transportation conditions generally throughout the country. In this connection he is to consider the "ability, financial or otherwise, of the carriers to improve their properties and furnish service and charge rates which will promote the commerce and industry

of the country and including, also, the stability of railroad labor employment and other improvement of railroad labor conditions and relations." The study preliminary to arriving at recommendations will, among other things, go into the problem of railroad unification, railroad reorganizations, the conditions likely to surround railroad credit in the future, the relation of the Government to the industry, the regulation of other transportation agencies, possible changes in the regulation of railroads, the proper co-ordination of all of the transportation agencies, and the control and improvement of labor conditions and relations.

Under the law, the Co-ordinator, it may be well to point out again, must in the first instance work with the carriers' committee. He cannot issue orders until matters have been referred to them and they have either made recommendations or have failed to act. Under the law, also, he will be restricted in issuing orders, at least under present conditions, by the limitation in the Act with respect to reductions in the number of railroad employees.

This does not complete the organization, and other announcements will later be made. Employment on the staff of the Co-ordinator is temporary in character, because the life of the Emergency Railroad Transportation Act, 1933, is limited to one year, with a possible extension for a second year. Much of the research work with a view to legislation will be carried on for an even shorter period of time.

John R. Turney, appointed director, Section of Freight Service, was born at Nashville, Tenn., in 1887. He received the degree of LL.B. in 1908 at Vanderbilt University. After engaging in private law practice for a number of years he was successively assistant attorney, general attorney, assistant general solicitor, and general solicitor, St. Louis Southwestern Railway 1907-29; vice-president in charge of law and traffic, same road, 1929-1933. He is a member of the law firm of Carter, Jones & Turney.

Olin C. Castle, who has been appointed director, Section of Car Pooling, was born at West Brownsville, Pa., in 1874. He received the degree of LL.B. in 1929 from the Houston School of Law. He entered railroad service in 1893 as telegraph operator and extra dispatcher, P. C. C. & St. L. (now part of Pennsylvania system) and has since held the following positions: Chief clerk to division superintendent, car service department, general managers' department, Butler & Pittsburgh division of Baltimore & Ohio, 1900-1907; specialist, committee on car efficiency, statistician, committee on interchange of freight cars, and railway mail pay committee, American Railway Association and American Railway Clearing House, 1907-1911; car service agent, Southern Pacific Lines in Texas and Louisiana, 1911-1917; superintendent car service, same road, 1917-1918; embargo and permit specialist, special assistant car service section, Washington, D. C., transportation staff officer to regional director, Atlanta, Ga., U. S. Railway Administration, 1918-1920; assistant superintendent of transportation and superintendent of transportation, Southern Pacific Lines in Texas and Louisiana, 1920-1933.

R. L. Lockwood, director, Section of Purchases, was born at Cleveland, Ohio, in 1878. He received the degree of M.E. in 1905 at the Case School of Applied Science. His experience includes 12 years in design, production, installation and sales, materials handling equipment; 3 years as engineer on public utility work, including electric railroads; 2 years as engineer in charge of development of radio-controlled aerial torpedo, U. S. Army Air Service; 4 years as consulting engineer on materials handling and special transportation and terminal equipment; 2 years on staff of National Metals Utilization Committee, work covering simplification and standardization of materials handling and transportation equipment; 1 year as officer of New York Central subsidiary, developing plans for use of special freight-carrying and handling devices; 4 years on staff of Division of Simplified Practice, Department of Commerce; about 2 years in charge of all simplification projects, specializing on engineering and transportation matters. He has also served in a consulting capacity on the same class of work.

Harlan J. German, Eastern Regional Director, was born in Nebraska, in 1881. He entered railroad service in 1894 as messenger boy, Burlington & Missouri River Railroad (now part of Burlington system); thereafter to 1913 he was in the mechanical and operating departments of the Burlington system; trainmaster and superintendent transportation, Denver & Salt Lake, 1913-1917; with Commission on Car Service under Railroads' War Board in Washington, 1917-1918; manager Eastern Railroads' Car Pool at Pittsburgh, 1918-1919; assistant manager Car Service Section, U. S. Railroad Administration 1919-1920; vice-president and afterward president Montour Railroad, 1920-1933.

Victor V. Boatner, Western Regional Director, was born at Bethlehem, Miss., in 1881, and was educated at Mississippi College and Bowling Green Business University. He entered railroad service in 1901 as station agent with Yazoo & Mississippi Valley and occupied various positions with that road up to chief train dispatcher, until 1907. Since then he has been trainmaster in various divisions of Y. & M. V. and Illinois Central, 1907-1916; superintendent New Orleans division, and later Memphis division, Illinois Central, 1916-1921; president, Peoria & Pekin Union, 1921-1929; president, Chicago Great Western, 1929-1931.

Clarence E. Weaver, Southern Regional Director, was born at Newark, N. J., in 1877. After receiving the degree of PH.B. in 1899 at Sheffield Scientific School, Yale College, he was successively assistant engineer Mexican International, 1899-1906; resident engineer and engineer maintenance of way on railroads in Mexico, now part of Southern Pacific of Mexico, 1906-1911; resident engineer, roadmaster, district engineer, southern lines, Illinois Central, 1911-1916; engineer maintenance of way, chief engineer, assistant general manager, general manager, Central of Georgia, 1916-1933.

William H. Chandler, Eastern Traffic Assistant, entered railroad service 1889 in the traffic department of the Louisville & Nashville. Later he was with the traffic department of the Central of Georgia and then of Ocean Steamship Company, 1892-98; industrial traffic manager at New York, 1898-1907, New England agent for Atlanta, Birmingham & Atlantic and subsidiary steamship companies, 1908-1909; assistant manager, Transportation Bureau, Boston Chamber of Commerce, 1909-1912, and of Traffic Bureau, Merchants Association of New York, 1912-1914; manager Transportation Bureau, Boston Chamber of Commerce, 1914-1924; manager Traffic Bureau, Merchants Association of New York, 1924-1933; president National Industrial Traffic League, 1919-1922; chairman Shippers' Conference of Greater New York, 1927-1932, and chairman of its executive committee, 1932-1933.

Charles E. Hochstedler, Western Traffic Assistant, entered railroad service in 1898 and served continuously with various railroads as telegraph operator, local agent, chief clerk in division offices, clerk and chief clerk in general freight offices, chief of tariff bureau, assistant general freight agent, and general freight and passenger agent until 1923. He was chairman of the special fourth section committee Central Freight Association in 1924; assistant traffic director, Chicago Association of Commerce, until 1927, and traffic director of that association from 1928 to date.

Marion M. Caskie, Southern Traffic Assistant, was for several years executive secretary, Southern Traffic League, serving as president and chairman of its board several terms, and also as regional vice-president National Industrial Traffic League and has been general

manager, State of Alabama ocean and rail terminal, at Mobile and general manager Terminal Railway, Alabama State Docks, since 1931.

Otto S. Beyer, after an extensive experience in mechanical, experimental and personnel work, has been engaged from 1920 to date as consulting engineer, first in New York and since 1924 in Washington, in which capacity he has devoted most of his time to the furtherance of constructive labor relations, especially in the railway industry.

Leslie Craven was valuation counsel for the western railroads, 1919-1932, and has since been professor of Law, Duke University Law School, Durham, N. C.

William B. Poland has been engaged as consulting engineer at New York for several years. He has been general manager and chief engineer, Alaska Central; vice-president and chief engineer, Phillipine Railways; director general, railway and port constructions, Yugoslavia; representative American bondholders and director Administration of State Monopolies, Kingdom of the S. H. S. As director general of railways, Imperial Government of Persia, he laid out and began the construction of the line from the Caspian Sea to the Persian Gulf and established a system of railway finance. He was later expert in railway finance and reorganization of railways for the Chinese Government and member of the commission of financial experts under presidency of Dr. E. W. Kemmerer, revising China's system national finances.

Fred W. Powell has been editor and senior staff member of the Institute for Government Research, Washington, 1920-1933.

James W. Carmalt, executive and legal assistant to the Co-ordinator, has been engaged in law practice in Washington since 1919. He was chief examiner of the commission from 1915 to 1918 and in 1918-1919 was assistant to the general counsel of the U. S. Railroad Administration.

John L. Rogers, executive assistant, entered the service of the Interstate Commerce Commission in 1917 as mechanical engineer in the Bureau of Locomotive Inspection. Since 1925 he has served as special examiner, Bureau of Service.

Offices for the new organization in Washington have been established in the Hurley-Wright building, across the street from the Interstate Commerce Commission building. Mr. Eastman, while retaining his office as a member of the commission, has been relieved of his commission duties except such as he may elect to perform, or except when his vote may be needed to decide a tie among the commissioners.

Eastman Sits With Cabinet

By virtue of his office as co-ordinator Mr. Eastman has become a member of a new "recovery council," the appointment of which was announced at the White House on July 11, which is to meet with the President on Tuesdays in place of the usual Cabinet meeting. The council includes the President and his Cabinet and heads of the new government organizations, such as the National Recovery Administration, the Reconstruction Finance Corporation, etc., and, according to the announcement, is to "co-ordinate the organization and work of the new government agencies." This, for the first time, gives an opportunity for a regular representation of transportation interests in the President's councils.

Without public announcement the President has recently also appointed a general advisory committee on transportation as an enlargement of the informal committee headed by Secretary Roper of the Department of Commerce which assisted him in the formulation of the new emergency railroad legislation. There has been no official statement of its purpose but it is understood that it is to keep in general touch with transportation developments and give advice to the President, from the viewpoint of various government departments and interests, in connection with proposals for new transportation legislation which it is hoped to have ready for consideration at the next session of Congress. The committee includes four Cabinet officers, the Secretaries of Commerce, War, and Agriculture, and the Attorney General; the federal co-ordinator of transportation, Joseph B. Eastman; Commissioner Frank McManamy of the Interstate Commerce Commission; the chairman of the Reconstruction Finance Corporation; Senator Dill, chairman of the Senate committee on interstate commerce; Representative Rayburn, chairman of the House committee on interstate and foreign commerce; and Dr. W. M. W. Splawn, special counsel to the House committee. While the committee will co-operate to some extent with the co-ordinator, the recommendations which he is directed to make for legislation for the improvement of transportation conditions, under the terms of the law creating the office, are to be his own and are to be submitted from time to time to the commission and transmitted by it, with its comments, to the President and to Congress.

The Great Northern's Successful Refinancing

THE Great Northern recently completed, without government assistance, a refinancing operation of the first magnitude. This involved the extension for ten years of the maturity date of $41,963,000 of consolidated mortgage bonds of the St. Paul, Minneapolis & Manitoba which came due on July 1. To secure this extension the company had first to obtain the assent of a majority of the holders of its general mortgage bonds, and holders of more than 98 per cent of them agreed to this. It then asked the holders of the St. Paul, Minneapolis & Manitoba to agree to the extension, having first made arrangements with the First National Bank of New York to pay on maturity the holders of up to 25 per cent of the bonds who might not agree to the extension. Since over 80 per cent of these holders did agree to the extension, the arrangement made with the bank was more than ample to assure the success of the plan.

Table I—Great Northern—Selected Revenues and Expense Items—1932 and 1929 Compared

	1932	1929	+Increase −Decrease Percent
Freight Revenue	$45,960,599	$101,178,779	−54.6
Passenger Revenue	3,941,659	11,298,351	−65.1
Total Operating Revenue	55,549,246	125,932,807	−55.9
Maintenance of Way Expenses	7,771,027	17,073,972	−54.5
Maintenance of Equipment Expenses	12,428,088	20,278,320	−38.7
Transportation Expenses	20,592,334	38,351,284	−46.3
Total Operating Expenses	45,655,672	82,862,910	−44.9
Net Revenue from Railway Operations	9,893,573	43,069,897	−77.0
Operating Ratio, Per Cent	82.19	65.79	+24.9
Taxes	6,697,423	9,201,154	−27.2
Net Railway Operating Income	1,290,551	32,457,523	−96.0
Non-Operating Income	5,096,091	12,026,226	−57.6
Gross Income	6,386,642	44,483,750	−85.6
Deductions from Gross Income	19,792,081	18,815,199	+4.8
Net Income	Dr.13,405,438	25,668,551	−152.23

Table I shows operating revenues and expenses of the company for 1932, compared with 1929. This comparison, great as the contrast is, does not fully reflect the

depth of the depression because 1929 was not the road's most prosperous year. In 1928 its gross revenues were substantially greater than in 1929. The decline in operating revenues of 55.9 per cent, it will be noted, was met by reducing maintenance of equipment expenses by 38.7 per cent, maintenance of way expenses by 54.5 per cent and transportation expenses by 46.3 per cent; making a total decrease in operating expenses of approximately 45 per cent.

This was not sufficient, naturally, to offset the loss in revenues and the operating ratio rose from 66 to 82. Taxes showed only a 27 per cent decline and net railway operating income in 1932 was only about 4 per cent of the 1929 total. Non-operating income (the largest source of which is dividends from the Chicago, Burlington & Quincy) likewise fell sharply so that the company, after deductions for fixed charges, had a net deficit of 13 millions in 1932, compared with net income of almost twice that sum in 1929.

Table II—Great Northern—Selected Operating Statistics—1932 and 1929 Compared

	1932	1929	+Increase −Decrease Percent
Revenue Ton-Miles (thousands)	4,324,700	10,150,709	−57.4
Revenue Passenger-Miles (thousands)	164,220	367,978	−55.4
Average Revenue Per Ton Mile (cents)	1.063	0.997	+6.6
Average Revenue Per Passenger Mile (cents)	2.400	3.070	−21.8
Average Haul of Freight (miles)	368	256	+43.8
Average Passenger Journey (miles)	194	162	+20.0
Average Revenue Tons per Train	581	962	−39.6
Average Speed of Freight Trains (miles per hour)	14.9	12.3	+21.2
Gross Ton-Miles per Train-Hour	24,991	27,410	−8.8
Per Cent Loaded to Total Car-Miles	64.5	66.2	−2.5
Lb. of Coal per 1000 Gross Ton-Miles	131	127	+3.0
Percentage of Freight Locomotives Unserviceable	21.6	23.2	−6.8
Percentage of Freight Cars Unserviceable	5.7	4.9	+16.4

Similar comparisons of operating statistics are made in Table II. It is to be noted that the actual volume of passenger travel decreased less than freight traffic, although the percentage of the revenue decline was greater because of the rate reductions averaging almost 22 per cent. The great increase in the length of haul of both freight and passenger traffic probably reflects further diversion to motor transportation. The revenue tonnage per train fell 39 per cent, doubtless because service to shippers was maintained even when tonnage was not available for full trains. Train speed was materially improved and gross ton-miles per train hour declined only slightly. The minor increase in coal consumption per 1000 gross ton-miles is remarkable in the face of the severity of the decline in the average train load and the increase in speed. The figures on equipment condition are striking—disclosing only a moderate increase in the ratio of unserviceable freight cars and an actual decrease in that of unserviceable locomotives.

In the annual report of the company for 1932, President Kenney tells of determined efforts which are being made to solve the passenger traffic problem. Low-rate excursions are being operated with favorable results, unprofitable trains are being eliminated or replaced by mixed trains or rail motor cars, and sleeping cars that are inadequately patronized to show a profit are being withdrawn. The company has been a pioneer in the pooling of passenger service. Considerable progress has been made this year in further regulation and more adequate taxation of trucks in the Northwest which is proving of considerable benefit to the road in meeting competition from this source.

Last year was a trying one, but the tide has now turned for the Great Northern. Aside from its successful meeting of the problem of the large bond maturity, traffic and earnings are rapidly improving. In May this year the company had net railway operating income of one million dollars, as compared with a deficit of three-quarters of a million in 1932. The cumulative deficit in net railway operating income for the first five months stood at $144,985 at the end of May this year as compared with $2,387,250 last year. In June it will disappear entirely and the cumulative total will be well in the black. This is a safe prediction in view of the fact that the road's car loadings for the week ended June 24 were 18 per cent above those of a year ago.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading continued its spectacular increase in the week ended July 1, amounting to 634,074 cars. This was an increase of 29,406 cars as compared with the preceding week and of 145,793 cars as compared with the corresponding week of 1932, while the decrease as compared with 1931 was only 33,556 cars, because the corresponding week in that year contained a holiday. Loading of all commodities except livestock showed increases as compared with the preceding week and all commodities showed increases as compared with last year. The largest increases were shown as to grain and grain products and coal. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading
Week Ended Saturday, July 1, 1933

Districts	1933	1932	1931
Eastern	146,444	111,747	145,984
Allegheny	129,400	93,359	129,062
Pocahontas	45,549	28,571	41,146
Southern	91,662	72,312	93,111
Northwestern	82,471	62,329	90,684
Central Western	86,333	79,417	111,528
Southwestern	52,215	40,546	56,115
Total Western Districts	221,019	182,292	258,327
Total All Roads	634,074	488,281	667,630
Commodities			
Grain and Grain Products	46,123	30,607	47,675
Live Stock	15,364	13,657	14,788
Coal	112,302	67,033	100,939
Coke	7,190	3,037	4,576
Forest Products	28,119	15,417	24,782
Ore	17,413	5,103	29,919
Mdse. L. C. L.	171,362	171,031	188,387
Miscellaneous	236,201	182,396	256,564
July 1	634,074	488,281	667,630
June 24	604,668	498,993	759,363
June 17	587,931	518,398	739,094
June 10	564,546	501,685	732,409
June 3	508,234	447,412	761,084
Cumulative total, 26 weeks	13,241,718	14,107,820	19,020,485

The freight car surplus for the first half of June averaged 522,785 cars, a decrease of 29,996 cars as compared with the last half of May. The total included 268,648 box cars, 188,906 coal cars, 30,517 stock cars, and 10,991 refrigerator cars.

Car Loading in Canada

Car loadings in Canada for the week ended July 1 totaled 35,285 cars, which was a decrease from the previous week of 4,542 cars, but after adjusting for the holiday (July 1) the index number rose from 62.97 to 64.96. The total was 987 cars under last year's similar week.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
July 1, 1933	35,285	20,673
June 24, 1933	39,827	19,688
June 17, 1933	40,571	19,283
July 2, 1932	36,272	15,784
Cumulative Totals for Canada:		
July 1, 1933	900,861	460,332
July 2, 1932	1,076,846	528,864
June 27, 1931	1,258,940	713,962

Railroads Again Serve Nation in Emergency

Only transportation agency that could be relied upon to handle huge reforestation army on schedule

FOR the second time in the last 16 years, the railroads of the country have been the only transportation agency that could serve the country in an emergency of magnitude. During the war, the railroads were called upon to transport almost 3,000,000 soldiers, while during April, May and June of this year, they handled almost 400,000 men and officers enrolled in the Civilian Conservation Corps. On both occasions, the government, when confronted by an emergency which required the movement of men on reliable schedules, chose the railroads in preference to any other form of transportation because the railroads could be depended upon to perform the service demanded.

Following the act of Congress in April, whereby unemployed men between the ages of 18 and 25 years were hired by the government to engage in reforestation work, the United States Army called upon the railroads to transport the 310,000 persons enrolled and their officers, their equipment and food. Ten days later, on April 17, the railroads' organization was perfected and the movement of the Reforestation Army began. From April 17 to June 30, the date on which the movement had to be completed, the railroads carried those enrolled to enrollment stations, thence to conditioning camps and finally to the work camps, forests and national parks, mobilizing approximately 1,000 special trains. Besides furnishing transportation to the rail head at destination, the railroads arranged for transportation from the rail head to the work camps, forests and national parks. Throughout the entire movement, there was not a failure, the whole demonstration being a triumph of American railroading and particularly of the passenger traffic departments of the railroads.

Despatch Paramount

The magnitude of this enormous task which was accomplished without interrupting regular service, is reflected in some of the actual movements. At Camp Knox, Ky., one of the conditioning camps, a train left every two hours on June 7, while during the period from June 7 to 12, a total of 42 trains carried the men from Camp Knox to work camps as far distant as Vancouver Barracks, Wash., and other points in Northern California. Some of the single movements were large and over considerable distance. A train of 22 cars carried 550 men from Camp Dix, N. J., to Clarkia, Idaho.

The speed with which the trains were handled further indicates the magnitude of the task. Between Chicago and Omaha, 487 miles, the participating carriers maintained a schedule of 12¼ hr. for the special trains. On June 19, an 18-car train carrying 499 passengers left Ft. Slocum, N. Y., at 7 p.m. and arrived in Ft. Lewis, Seattle, Wash., 3,204 miles away, at 2:10 p.m. on June 23.

The successful movement of this army results from the fact that the railroads were organized. Since 1914, the War department, the Navy department and the Marine Corps have had agreements with practically all of the rail lines in the United States for the handling of all military and non-military passenger traffic under the jurisdiction of the three military branches, the agreements being predicated upon a co-ordinated plan for carrying out the details incident to the mobilization and transportation of the military forces of the United States in the event of a national emergency. Under the plan, each of the territorial passenger associations in the United States maintains an organization for the preparation of routes, schedules and other details connected with troop movements. These include the New England, the Central, the Southeastern, the Southwestern, the Trans-Continental and the Western passenger associations, the latter three of which operate through the Western Military Bureau.

A committee representing these associations is located in Washington and is in direct contact with the quartermaster general of the Army, the chief of the Bureau of Navigation, the Navy department and the quartermaster of the Marine Corps. In addition, it is in direct contact with the Car Service division of the American Railway Association. The activities of all of these organizations, in connection with military traffic, are closely co-ordinated and can be expanded rapidly to meet any requirements of an emergency involving the national defense.

Passenger Associations Divided Traffic

This plan, under which the railroads and the government co-ordinate their efforts, provides for the distribution of the transportation burdens equitably among all carriers that are parties to the agreement with the military branches, in such a way as to avoid undue congestion on any particular line or lines which might result in interference with regular commercial traffic. To bring this about, the passenger organizations have worked out a plan under which the several chairmen are authorized to divide the competitive traffic on an equitable basis among the participating carriers.

The value of the military agreement and the co-ordinated activities of the military branches and the carriers under the agreement was well demonstrated in connection with the problem facing the War department in arranging for transportation of the Civilian Conservation Corps from places of enrollment to the reception and reconditioning camps, and from the latter to the work camps. When President Roosevelt directed the War department to take over the transportation activities, the quartermaster general immediately called the chairmen of the several territorial passenger associations into conference and within five days the organization was completed and began active operations. This necessitated the appointment of representatives of the

rail lines at all corps area headquarters to contact the quartermasters. In some of the western corps areas, where large areas necessitated some decentralization of the activities, representatives were appointed at numerous reception and reconditioning camps to handle the problems arising in connection with these movements directly with the local quartermasters.

All activities were co-ordinated in such a way that all the transportation requirements which the carriers were called upon to furnish were arranged promptly, so that the men, together with their baggage, impedimenta and supplies including field ranges and rations, could be transported in special trains. To handle the 310,000 men, the Pullman Company was called upon to assemble 850 tourist sleeping cars.

Railroads Provided Transportation from Railhead

In many cases, the work camps to which the men were assigned were located at some distance from the railroad, requiring highway transportation. Practically all such transportation was arranged for by the rail carriers through the co-ordinated activities set up to handle these movements.

As soon as the locations of the various camps were designated, the several chairmen of the passenger associations were furnished information and immediately, through the representatives of the terminal carriers serving the forest reserves, contact was established with the chief forester and with the military authorities in that location and highway transportation was arranged from the railhead to the work camps. In providing the service, the carriers endeavored to employ existing truck and bus companies, but in some localities it was necessary to organize farmers and town people with trucks and automobiles to transport the men and their equipment from the railhead to the camps.

Besides demonstrating the value of railroad transportation to national defense, the movement of the Reforestation Army indicates what can be accomplished when the railroads co-ordinate their own efforts. By joint agreement, the railroads considered the movement quasi-charitable and established favorable rates. As a result of this co-operation among the railroads, they were able to secure revenues totaling $6,000,000, of which amount the revenues accruing to the western lines totaled $3,500,000, $2,264,907 coming from tourist sleeping car movements on which there was an additional surcharge of $226,490.

Another phase of the movement was the routing of Pullman cars. This was handled through the general offices of the Pullman Company at Chicago, a representative at Washington forwarding the orders for cars by telephone. In assembling the cars for loading, extra cars located adjacent to the loading points were utilized. The 850 Pullman cars used in the movement averaged two trips each, while some made as many as four trips. A total of 237 Pullman car trains were operated.

One of the conditions which made the operation of Pullman cars complex was the change in routing after the train had departed. This was due to the fact that all work camps were not completed when the movement started and as completion occurred the destination of cars was changed while the train was enroute.

In addition to the movement of the men and their equipment and supplies, which included baggage, a field kitchen for every two companies (300 men) and 10 days' rations, considerable freight was handled. Among the items used by the army were 3,400,000 tent pins, 2,000,000 wool socks, 400,000 bath towels, 500,000 huck towels, 270,000 cravats, 350,000 pillow cases and sheets, 500,000 pairs of shoes, 2,500,000 yards of denim, 850,000 jumpers, 500,000 trousers, 800,000 flannel shirts, 3,000 1½-ton trucks, 300 ambulances and 300 light passenger automobiles.

Repairing Bridges With Wrought Iron Plates

By W. R. Roof*

TO those responsible for the maintenance of steel bridges, corrosion due to brine drippings is a source of continual annoyance. Frequent cleaning and painting must be done to postpone the renewal of the affected parts, which oftentimes last about half as long as anticipated. On roads carrying heavy volumes of refrigerated traffic, damage to bridges is illustrated by

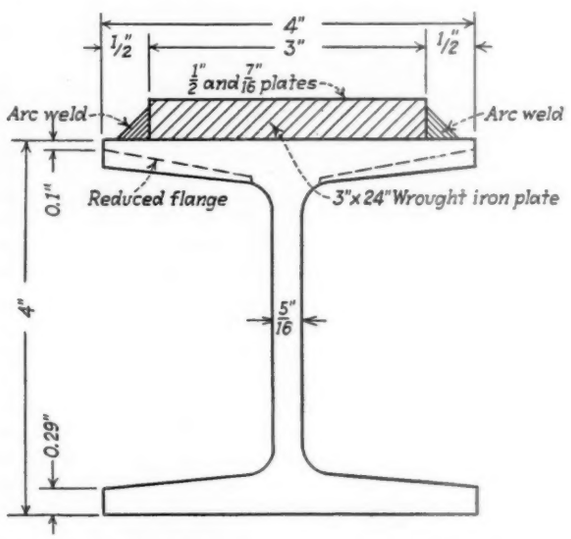


Fig. 1. Illustrating the Manner in Which the Tested Beams Were Prepared by Reducing the Flange and Welding on a Wrought Iron Plate

the fact that a single road is now completing a program of bridge repair and renewal involving an expenditure of more than a million dollars, made necessary solely by this form of corrosion on a limited mileage of its system.

Progress in the art of electric welding has greatly simplified the problem of applying additional metal to old bridge members, either to increase their strength for heavier loading or to replace metal destroyed by corrosion. The Chicago Great Western was one of the first railways to use electric welding for this purpose, and it has since been employed so extensively on various roads that its economy in strengthening steel bridges is now generally recognized.

One of the most common applications of the process is in the welding of cover plates to the top and bottom flanges of floor beams and stringers, because floor members are more frequently overstressed than any other part of an old bridge. Moreover, the drippings from refrigerator cars have a particularly corrosive effect on the top flanges of floor members, thereby necessitating the addition of new metal.

The selection of material to be used in the reinforcement of old bridges, especially those that are subject to the action of brine drippings, is of the utmost importance, and it has been observed that members of old

* Bridge Engineer, Chicago Great Western.

wrought iron bridges, which have been subjected to the action of brine drippings, have suffered little reduction in sectional area, and even after many years exposure such structures are still in good condition. In view, therefore, of the resistance of wrought iron to brine drippings, and since wrought iron plates are now available at reasonable cost, it is logical to consider seriously the use of this material for cover plates at those points on steel bridges where corrosion from salt brine is a factor. This conclusion focuses attention on two important questions, namely; (1) will wrought iron restore the necessary physical strength, and (2) can wrought iron be satisfactorily welded to steel? In order to answer these questions, a series of tests were made by a testing laboratory on steel H-beams having welded wrought iron cover plates. These plates conformed to the American Society of Testing Materials Specification A 42-30, Class A, and the writer developed the design of the test specimens.

Test Specimens

Bending tests were made of 4-in. H-beams weighing 13.8 lb. per ft. and having a length of 36 in., the beams being rested on supports 33 in. apart and subjected to a concentrated load at mid span. The tests included (a) full-size beams; (b) beams with one flange planed down to represent the reduction in area due to corrosion, and (c) reduced-flange beams reinforced by arc-welded wrought iron cover plates on the reduced flange. Part of the beams used in groups (b) and (c) were tested with the altered flange in tension and the rest with the altered flange in compression.

In Fig. 1 is shown a typical section of the tested beams, illustrating the manner in which the flanges were reduced and showing the method by which the section was restored by the use of arc-welded wrought iron cover plates. A view of one of the specimens, after being subjected to bending with the restored flange on the compression side, is shown in Fig. 2. The arc-welding of all specimens was found to be intact after failure of the beams, even though actual ruptures of the steel beams occurred in some cases. Tabulated results of the tests are shown in the table, while Fig. 3 is a graphical representation of the results, these records indicating that arc-welded wrought iron cover plates function in a satisfactory manner.

Fig. 2. Typical Failure of a Test Specimen

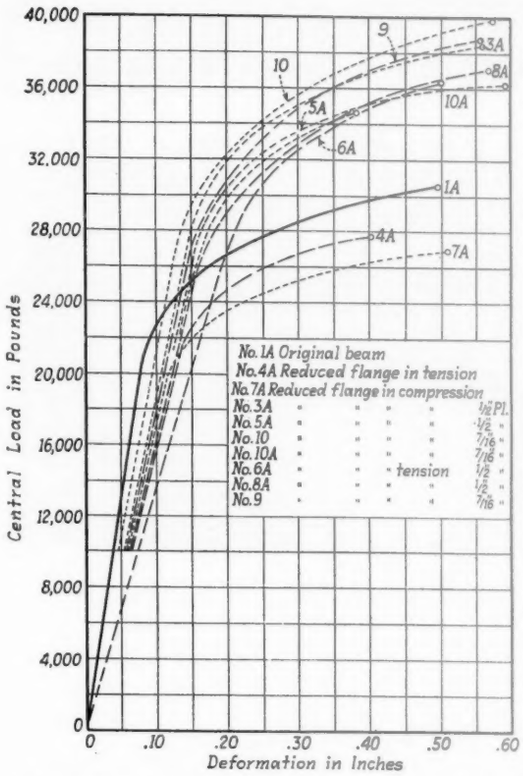


Fig. 3. Chart Showing the Deformation Under Load of the Various Test Specimens

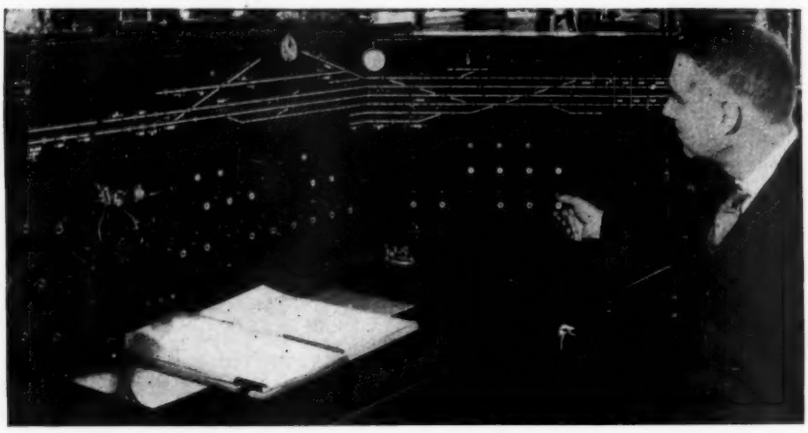
An analysis of the results obtained satisfactorily answers both of the questions regarding the use of wrought iron that were stated at the beginning of the article, and indicates that a judicious selection and combination of materials is both feasible and practical. These test results were later confirmed on a larger scale in connection with a bridge repair program where it was found that no difficulty was experienced in welding various combinations of wrought iron and steel. In this work six welders on three bridges made a total of 18 fillet welds on wrought iron and 8 fillet welds on steel. The fillets were $\frac{5}{16}$ in. and were proportioned for an assumed working stress of 2,500 lb. per lin. in. For the wrought iron the average weld value was 9,280 lb. per lin. in. and for steel 9,520 lb. per lin. in.

From the test results obtained and the well-known resistance of wrought iron to corrosion, it is evident that the application of wrought iron plates offers an economical method for the rehabilitation of existing steel railway bridges. The recognition and utilization of the inherent values of these two materials is sound engineering practice, a practice already exemplified by the work of railroad engineers who base their selection and specification of materials on authentic service records. The known record of the behavior of any material under well defined operating conditions is a safe guide to follow.

Summary of Test Results

Test No.	Description	Weight, Pounds	Maximum Load, Pounds	Maximum Deflection, Inches	Load at Yield Point, Pounds	Relative Safe Strength	Deflection Under 1000 Lb. Load Inches	Relative Stiffness
1-A	Original section	41.20	40,000	3¼	20,800	1.00	.045	1.000
4-A	Reduced flange in tension	38.80	37,000	3½	22,700	1.09	.062	.726
7-A	Reduced flange in compression	38.20	36,000	4	19,800	.95	.055	.818
6-A	Reinforced flange in tension with ½ in. cover plate	48.95	42,700	1¾	28,700	1.38	.066	.682
8-A	Reinforced flange in tension with ½ in. cover plate	49.40	43,000	2⅛	27,000	1.30	.058	.776
3-A	Reinforced flange in compression, ½ in. cover plate	50.10	48,500	3¾	23,700	1.14	.050	.900
5-A	Reinforced flange in compression, ½ in. cover plate	49.20	47,500	2¾	25,300	1.22	.051	.882
9	Reinforced flange in tension, 7-16 in. cover plate	49.50	45,800	2½	29,600	1.42	.055	.818
10	Reinforced flange in compression, 7-16 in. cover plate	49.00	49,450	3½	25,800	1.24	.043	1.045
10-A	Reinforced flange in compression, 7-16 in. cover plate	47.20	45,000	2⅝	19,400	.93	.051	.882

New Centralized Traffic Control on the B. & M.



The Control Machine in the Tower of an Interlocking Plant at Waltham, Mass.

Installation includes two important junctions and 24.6 track miles of main line

THE Boston & Maine has installed a remotely-controlled interlocking system which includes 8.5 miles of line involving 24.6 track miles, replaces a mechanical interlocking plant at West Cambridge, Mass., and also includes the control of another intermediate junction at Hill Crossing. The entire layout is controlled from a new C. T. C. machine located in the tower of an existing interlocking at Waltham, Mass. The towerman handles the C. T. C. machine, in addition to the interlocking at that point. West Cambridge is 4.2 miles from Boston on the Fitchburg division, between which points heavy suburban traffic is handled, as well as through traffic moving between Boston and the west. A total of about 130 train movements are handled daily by the towerman in charge of this machine.

Telephone communication, with loud speakers above the C. T. C. machine, keeps the towerman in touch with towermen at adjacent plants, as well as with the dispatcher at Greenfield, Mass. The introduction of the C. T. C. installation has, therefore, facilitated train movements in this territory, and has, in addition, reduced operating expenses by eliminating the West Cambridge interlocking, where one leverman was required for each trick.

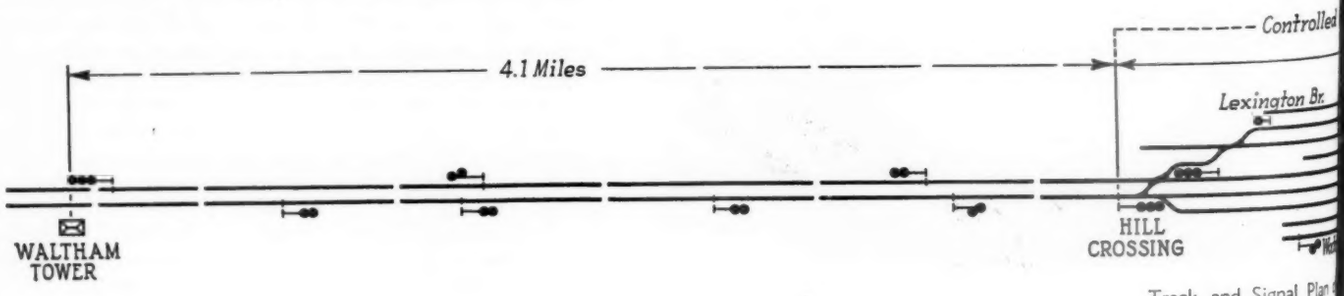
General Layout

As shown on the diagram, the Watertown branch, the Central Massachusetts branch, and the Lexington branch join the main line at West Cambridge. Five single switches and six crossovers, all power-operated, are included in this layout. The Watertown Branch junction with the main line was formerly double track with half-slips which were worn out; the remaining turnouts and crossovers were short, thus introducing too much delay to train movements when crossing over. It was necessary, therefore, to revise the entire track layout, using No. 15 turnouts wherever possible. As a part of the change, a single-track junction was installed for the Watertown branch, with a new end of double track at a new switch 403 ft. back from the main line. These track changes would have required the entire reconstruction of the old mechanical interlocking. It was decided, therefore, to install electric switch machines and new signals, and to control the entire layout from the existing tower at Waltham, 5.7 miles west.

At an intermediate point, Hill Crossing, there are a crossover and a junction switch for a line leading north and east to the main freight classification yard. This Hill Crossing layout, including one single switch and two crossovers, is power-operated, and had been controlled remotely by a separate desk lever machine in the old tower at West Cambridge. As a part of the change, the control for the switches and signals at Hill Crossing was included in the new C. T. C. system.

The new signals are all of the searchlight type, the high signals having three light units to afford speed-signaling indications, as shown in the A. R. A. Code charts, with a few additional indications required by special conditions at certain points. As a part of the improvement, the old semaphore automatic signals between Tower H, at Boston and Waltham, were removed and new color-light signals were installed, affording three or four block indications, as required for braking distance.

The entire territory from Tower H to Waltham includes 20 power-operated switches, 12 dwarfs and 7 high signals, which are controlled from the machine and,



Track and Signal Plan

in addition, 16 automatic signals. The illuminated track diagram on the control machine reproduces this entire territory, with a separate lamp for each track circuit so that the towerman knows the location of all trains and thereby has more time to devote to switching movements. The C. T. C. machine has 13 levers for signals and 9

View of Power-Switch Layouts

levers for switches. Provision is made for extending the system westward a distance of 25 miles.

The Control System

The control system used on this installation is the latest code type furnished by the General Railway Signal Company. One circuit is used for sending out the control codes. The towerman sets all the switch and signal levers for clearing a certain route, then presses a starting button under the signal lever, after which the code controls go out for the entire combination. As each switch changes its position and is locked, and as each signal clears, these facts are indicated on the control machine, codes for these incoming indications coming in over the indication circuit. Only four seconds are required for a complete set of control codes to go out or of indication codes to come in. A special feature of this machine is that if a towerman sets up an impossible combination, his attention is called to his error at once by a special buzzer known as the "barker".

In order to give a train a "call-on" indication, i.e., to permit it to enter an occupied block or section of a plant, the leverman must complete a special operation by setting the signal lever, pushing the starting button, then pushing a special yellow button over the lever and then again pushing the starting button. This procedure prevents the operator from clearing a call-on signal inadvertently.

Mounted at the top of the diagram on the control machine are lights to indicate whether a-c. power is on at West Cambridge, as well as at Waltham. At the upper right corner of the diagram, two lights indicate whether a "ground" exists on the switch operating and control circuits. Mounted in a small cabinet at the end of the machine is a set of lights and switches by means of which the maintainer can step-check the operation of each step of a code and thereby quickly locate any trouble.

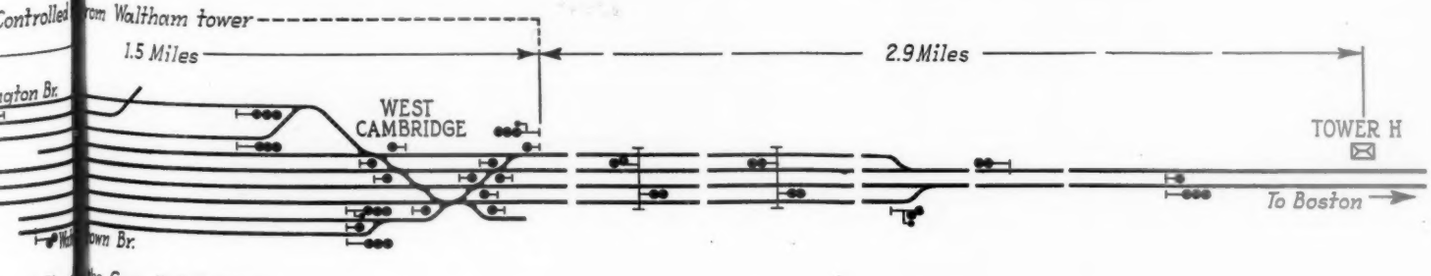
At Waltham, the coding equipment, relays, battery and charging apparatus for the control station are housed in a new brick building adjacent to the tower. The wires between this instrument house and the control machine are run in eight 31-conductor lead-covered cables. At Hill Crossing and at West Cambridge, small houses built of copper-bearing sheet steel house the control equipment and battery. These houses are lined with Celotex to assist in maintaining a uniform temperature.

The switch machines at West Cambridge are the G. R. S. Model-5D dual-control type. A new feature for a C. T. C. installation is the fact that these machines operate on 110 volts d-c. Therefore, the movement is fast, the operation from normal to reverse being completed in about 2¼ seconds. On account of the close headway between trains during the morning and evening hours, this fast operation is an important factor. Likewise, to facilitate operation of the plant, the route and detector locking is arranged so as to release a switch as soon as a train clears it, this arrangement being used here for the first time on an installation of C. T. C., although it is standard practice on large interlockings.

The wiring between the instrument houses and the switches and signals is all in underground parkway cable. Large cables, including as many as 60 conductors, are run from the house to junction boxes located at central points, and smaller cables run from these boxes

Searchlight Signals are Used

to each signal, switch and track connection. Storage batteries on a-c. floating charge, through G. R. S. rectifiers, are used for the operation of the switches, track circuits, control circuits, etc., as well as for stand-by



...he Controlled Territory

supply for the signal lights in the event of an a-c. power outage. All storage batteries are of the lead type, furnished by the Electric Storage Battery Company.

The signalling equipment on this installation was furnished and installed by the General Railway Signal Company, according to plans and specifications prepared by the signal department of the Boston & Maine.

A. R. E. A. Proposes 112-lb. Rail Section

IN the interest of standardization and simplified practice, the Board of Direction of the American Railway Engineering Association has authorized a letter ballot of its membership on the adoption of a new 112-lb. R.E. Rail section, developed by the Committee on Rail to supersede the present standard 110-lb. R.E. section. This new section corresponds in all details, except size, with the new 131-lb. R.E. section adopted at the convention in March, and was agreed upon by the Committee on Rail on June 15. The unusual action of the Board of Direction to undertake the adoption of a standard by letter ballot rather than by action at an annual convention, is explained in the argument accompanying the ballot.

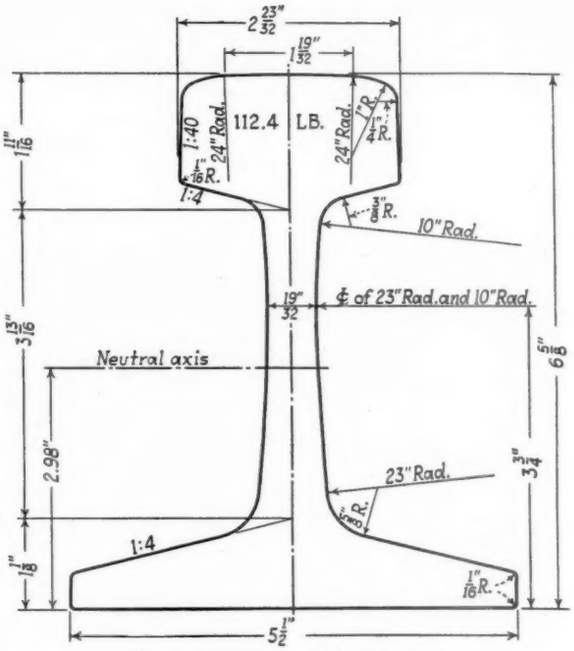
"It is desired to submit this new 112-lb. section promptly, with the 131-lb. section already adopted by the association, to the American Railway Association for endorsement and approval and presentation to the member railroads, so that the new sections may be available for rolling the latter part of this year.

"It is intended that this new section will be the only section between the 100-lb. R.E. and the 131-lb. R.E sections, and therefore its weight might properly approach the half-way point. Consideration, however, was given to the desire of the users of the present 110-lb. R.E. section not to increase the weight to any great extent. Within reason, the weight was permitted to fall where it would, as the result of the rail dimensions agreed upon."

As in the case of the new 131-lb. section the principal change is an increase in the height and a distribution of the metal to afford greater strength and stiffness while retaining the same width and thickness of the base and the same width of the head at the gage line (5/8 in. below the top of the head) as the section it supersedes, so as not to affect the interchangeability of tie plates, rail anchors and the preboring of ties. The improvement in the properties of the new 112-lb. section, compared with the present standard 110-lb. section, is shown in the following table:

	110-lb. R.E.	112-lb. R.E.
Stiffness (Moment of Inertia)	100 per cent	115.5 per cent
Strength (Section Modulus)	100 per cent	108.1 per cent
Weight or Area	100 per cent	101.8 per cent
Area of Head (Total Area 100 per cent)	37.4 per cent	35.9 per cent
Area of Web (Total Area 100 per cent)	23.0 per cent	25.1 per cent
Area of Base (Total Area 100 per cent)	39.6 per cent	39.0 per cent
Ratio M. I. to Area	5.27	5.97
Ratio Sec. Mod. to Area	1.55	1.64
Ratio Base to Height	0.88	0.83

An important considertion prompting the development of the new pattern was a desire to permit of an increase in the strength and stiffness of the joint bars, which are dependent largely on the finishing depth. The submission to the members included a comparison of a joint bar for the 112-lb. section with a similar type for



Dimensions of the 112-lb. Section

Area-Head	3.96 sq. in.	Moment of Inertia	65.8
Area Web	2.77 sq. in.	Section Modulus-Head	18.1
Area Base	4.29 sq. in.	Section Modulus-Base	22.1
	11.02 sq. in.		

the 110-lb. section, which indicates an appreciable improvement, as shown by the following figures:

	110-lb. R.E.	112-lb. R.E.
Stiffness (Moment of Inertia)	100 per cent	135 per cent
Strength (Section Modulus)	100 per cent	122.6 per cent
Weight	100 per cent	108.7 per cent
Ratio M. I. to Area	1.76	2.19
Ratio Sec. Mod. to Area	0.81	0.91

A further indication of the considerations prompting the effort to obtain early action on the proposed rail section is to be noted in one of the concluding paragraphs of the communication to the membership.

"The trend of the times is toward standardization and simplified practice, for which there is a strong demand in the interests of economy. It is the purpose of the association to recommend standards that roads will use; the object being to eliminate the multiplicity of standards, for which railroads have been criticised."

* * *

A Section of the Chicago, Rock Island & Pacific's Exhibit at the Century of Progress Exposition

K. C. S. Proposes New Wage Plan

Fact-finding commission hears arguments for pay on time basis and simplified rules for engineers and conductors

REVOLUTIONARY changes in the rates of pay and in the working conditions of locomotive engineers and conductors, with what would amount to higher wages offered in return for the elimination of burdensome rules and regulations, have been proposed by the Kansas City Southern. The general principles underlying the proposed new schedules for these employees are reasonable compensation to the men, on a time basis, for all time worked by them, and the removal of all unnecessary restrictions as to the kind and character of the work done by them. Estimates of the increased wages which the employees would enjoy under the new schedules range from 13 per cent for conductors to 5 per cent for enginemen in road service and 9 per cent for enginemen in yard service.

The movement on the part of the railway toward the substitution of the new plans for the old rules came to a head in Kansas City, Mo., on June 22, when a hearing before a fact-finding commission, appointed by the President of the United States, began. Appointment of the fact-finding commission came as the result of a possible threat to the continuation of operations on the Kansas City Southern. After preliminary negotiations with the officers of the brotherhoods involved, which got nowhere, the management, on April 5, gave formal notice of intent to cancel the old agreements on May 15, and on the following day notices were given of the desire of the company to place the new K. C. S. wage plans for conductors and enginemen in effect on May 16. Following conferences with officers of the brotherhoods, the grand officers of the Brotherhood of Locomotive Engineers, the Order of Railway Conductors, the Brotherhood of Railroad Trainmen and the Brotherhood of Locomotive Firemen and Enginemen suggested that the case be placed before the board of mediation.

Edwin P. Morrow, mediator, arrived in Kansas City on May 23 and attempted to bring about an agreement, but while he was absent from that city from June 4 to 11, a strike vote was taken among the train and engine service employees, a majority favoring a strike. On June 12, Mr. Morrow asked both sides to agree to arbitrate the questions involved, which both declined to do. The appointment of the fact-finding commission was the immediate result. The members of the fact-finding commission were Frank P. Douglas, attorney, of Oklahoma City, Okla., who acted as chairman; Charles W. McKay, attorney, of Magnolia, Ark.; and Otto Bremer, banker, of St. Paul, Minn. The commission was to render its report to the President by July 12.

Representing the brotherhoods at the hearing were E. H. Kruse, assistant grand chief engineer of the B. of L. E.; F. J. Williams, vice-president of the O. R. C.; C. H. Smith, vice-president of the B. of R. T.; and F. W. Lewis, vice-president of the B. of L. F. & E. The B. of R. T. and the B. of L. F. & E. were involved only indirectly in the case since the Kansas City Southern has not yet drawn up new schedules applying to members of those organizations. However, old contracts with the train and engine service brotherhoods had consisted of two joint agreements, one between the B. of L. E. and the B. of L. F. & E., representing engine service employees, and the other with the O. R. C. and the B. of R. T., representing train service employees, and in order to cancel the agreements with the locomotive enginemen and conductors, it was necessary also automatically to cancel the agreements with the B. of L. F. & E. and the B. of R. T. The proposal of the railway, however, was to continue the provisions of the agreements with the latter brotherhoods in force as they had been, until new schedules could be prepared covering firemen and trainmen.

The brotherhoods confined their direct testimony before the fact-finding commission to a description of the old working agreements, giving their background in considerable detail. In opposing the new K. C. S. plan, witnesses for the brotherhoods charged that the new contracts were vague in their provisions, and that confusion would result with one type of schedule in effect on the Kansas City Southern and the old schedules in effect on neighboring railroads. They also criticised the K. C. S. management for not offering specific schedules for members of the B. of R. T. and the B. of L. F. & E.

Deramus Presents Railway's Case

The burden of presenting the management's side of the controversy was assumed by W. N. Deramus, general manager of the Kansas City Southern. Mr. Deramus was on the witness stand for several days, during which time the new K. C. S. plans were almost constantly under attack by representatives of the brotherhoods on account of the alleged vagueness of their provisions.

The avowed objectives of the new schedules for conductors and locomotive enginemen are to obtain more flexibility in operation; to bring relief from the strife that has followed in the wake of the old rules in the matter of time claims; to pay good wages on a simple plan that cannot reasonably be miscalculated or misunderstood; to leave working conditions substantially unchanged; and to distribute more fairly among the individuals the earnings for the conductors and enginemen as a class. The proposed schedule for conductors is as follows:

Section I

The following rates will be paid conductors from the time required to report for duty until relieved from duty; it being understood that time to register at final terminal will be included in time on duty, with a maximum of five minutes.

(a) *Regular Passenger Service*

Between Kansas City and Heavener	
Four crews assigned; Per trip of 14 hr. or less	$16.00
Between Kansas City and Heavener (via Ft. Smith)	
Four crews assigned; Per trip of 16 hr. or less	17.50
Between Heavener and Shreveport	
Three crews assigned; Per trip of 11 hr. or less	11.00
Between Shreveport and Lake Charles	
Two crews assigned; Per trip of 9 hr. or less	9.00
DeQuincy-Port Arthur turnaround	
One crew assigned; Per round trip in spread of 12 hr. or less	8.15
For each additional 30 min.	.50

If changes are made in length of runs or number of crews assigned, corresponding adjustments in trip rates will be made.

New regular runs will be paid on the basis of extra passenger service unless and until regular trip rates are established by agreement.

When conductors in regular passenger service are unable to make regular trips because of interruption of traffic, service rendered during such period, if any, will be paid for as extra passenger service.

(b) *Extra Passenger Service*

For the first three hours or less	$6.00
For each additional hour	1.00

Fractional portions of hour pro rata after the third hour.

Conductors in extra short turnaround passenger service, no single trip of which exceeds 80 miles, shall be paid the minimum allowance of $6 for three hours or less service and $1 per hour for each additional hour of service within the first 10 consecutive hours from the time first required to report for duty; also $1 per hour for each hour of service or held for service beyond the tenth hour. Fractional parts of hour to be paid for pro rata.

For the purpose of calculating time under this rule, the management will designate the initial trip.

(c) *All Other Classes of Service*

For the first four hours or less	$5.50
For each additional hour	.85

Fractional portions of hour pro rata after the fourth hour.

(d)

For service on the Arkansas Western, 80 per cent of the rates herein provided shall be paid.

Section II

When conductors are called and leave their place of residence, and for any reason other than their own are released without performing service, they will be paid $2.50 and stand first out. If held on duty more than two hours and released without performing service, they will be paid $5.50 and stand last out.

Section III

Conductors in pool and unassigned freight service who are held at away-from-home terminals will be under pay at the rate of 85 cents per hour at the expiration of 16 hr. from the time pay stopped in previous service. If not used in the meantime, they will remain under pay at the rate of 85 cents per hour with a maximum of six hours and, figuring from the end of the eighth hour, will again go under pay at the same rate at the expiration of the next sixteenth hour in the same manner. If service begins during any pay period, the rate provided in Section I will apply for the service performed. Home terminals will be designated by the company for the purpose of applying this rule.

Section IV

(a) Except in case of casualty or extreme weather conditions, conductors (other than those handling officers' specials, work trains or wrecking trains) tied up between district terminals prior to the expiration of 14 hours on duty, will be under pay at the expiration of 12 hours from time tied up and will continue under pay until released from service.

(b) Except in case of casualty or extreme weather conditions, conductors (other than those handling officers' specials, work trains or wrecking trains) tied up between district terminals on or after the expiration of 14 hr. on duty, will be under pay at the rate of 85 cents per hour at the expiration of the minimum legal period off duty under the hours-of-service law applicable to the crew, and will continue under pay at this rate until released from service at terminal or tie-up point.

Section V

(a) Regular assigned conductors held for and used in special service will be paid not less than the earnings of their regular run.

(b) Extra conductors held for service and losing their turn on the board will be paid the minimum for the class of service for which held, and a like amount for each 24 hr. or major fraction thereof so held thereafter.

Section VI

Regular assigned conductors ordered to attend court by this company will be paid the earnings of their run. When required to attend court on lay-over days, they will be paid $5.50 for each calendar day. Extra conductors attending court will be paid $5.50 for each 24 hr. or less. If away from home, they will be allowed necessary expenses. The railway company will be allowed their mileage and witness fees.

Section VII

(a) Deadheading in connection with the exercise of rights of seniority or on account of the operation of Section VI of this agreement, or to relieve other conductors who lay off either voluntarily or because of illness or non-occupational accident, will not be paid for.

(b) Deadheading other than that referred to in paragraph (a) of this section will be paid for on the basis of rates set up in Section I (b) for passenger service and Section I (c) for other service, whichever caused the deadheading. Deadheading will not be combined with service for the purpose of computing pay, except when deadheading to terminal after having been tied up under the hours-of-service law. In such instances, time waiting at tie-up point will not be paid for.

Section VIII

(a) Conductors in pool and extra freight service will be called for service out of terminals in the order of their arrival.

Exception 1. Conductors may be required to make short trips from a terminal to an outlying point and return, or from an outlying point to a terminal and return, on account of engine failure, running for fuel or water or other like emergency, and the time so consumed added to other time of their trip and paid for on a continuous time basis.

Exception 2. Two or more short turnaround trips may be made out of terminals on a continuous time basis provided no such trip shall be started by a conductor who has been on duty in such service as much as six hours when the additional trip will consume more than two hours.

Exception 3. Where no rested crews are available, "aggregating" is permissible, and the crew having the most time may be used.

(b) Conductors not used in accordance with paragraph (a) of this section will be paid $2.50 for a runaround and stand first out.

Section IX

(a) Conductors in road service (except regular local and combination crew assignments) will not be required to perform more than two hours' switching service except on their own trains at initial terminal, or more than two hours' switching service of any character at final terminal.

(b) Employees in yard service will not be used as conductors in road service when conductors are available, except in cases of emergency, and when so used, will be paid for the combined service on the basis of the yardmen's schedule.

(c) Combination crews may be assigned out of any station except Kansas City and Shreveport, and when so assigned, will be paid on the basis of Section I (c).

Section X

(a) No conductor will be suspended or discharged (except in serious cases where fault is apparent beyond reasonable doubt, or in case of intoxication) until he has had a fair and impartial hearing before the proper officials. During such hearing, he may be assisted by a conductor in service on his division. When decision is rendered, if such conductor believes it unjust, he may take up his own case on appeal to the higher authorities, and if he so desires, he may select a conductor in service on the same division to assist him in presenting his case, but such representation shall be of a purely personal character and shall not carry with it the sanction of committee representation; no adjustment made by the management in such cases shall be construed or cited as precedent in any case presented by the committee.

(b) A conductor shall have the right to have the regular constituted committee of his organization represent him in the handling of his grievance. Cases will be handled to a conclusion through established channels.

(c) If a conductor is suspended or discharged and is found not guilty, he shall be reinstated and paid for all time lost.

Section XI

Seniority rights of employees covered by this agreement will be fully respected and no change in such rights will be made except by written agreement with their duly authorized representatives. Regulations covering the acquirement and exercise of seniority rights and the increasing or decreasing of pools, boards, etc., will be promulgated by the general manager as a result of conference with the duly authorized representatives of the employees.

Rates of Pay for Locomotive Engineers

Section I of the proposed schedule for locomotive engineers, covering rates of pay, is as follows:

For all classes of locomotives, the following rates will be paid from the time required to report for duty until relieved from duty; it being understood that time consumed inspecting engines at the final terminal when required will be included in time on duty, with a maximum of 10 min., and that time required to register and make work reports will not be included:

(a) *Engineers Assigned to Passenger Service Except Short Turnaround Service*

For the first three hours' service or less	$6.00
For each additional hour	1.50

Fractional portions of hour pro rata after the third hour.

(b) *Engineers in Short Turnaround Passenger Service*

Engineers in short turnaround passenger service, no single trip of which exceeds 80 miles, shall be paid the minimum allowance of $6 for 3 hr. or less service, and $1.50 per hour for each additional hour of service within the first 10 consecutive hours from the time first required to report for duty; also $1.50 per hour for each hour of service, or held for service, beyond the tenth hour; fractional parts of hour to be paid for pro rata.

For the purpose of calculating time under this rule, the management will designate the initial trip.

(c) *Engineers Assigned to Other Road Service*

For the first four hours' service or less	$6.50
For each additional hour	1.00

Fractional portions of hour pro rata after the fourth hour.

(d) *Engineers Assigned to Yard Service*

For the first six hours' service or less	$5.70
For each additional hour	.95

Fractional portions of hour pro rata after the sixth hour.

(e)

For service on the Arkansas Western, 80 per cent of the rates herein provided shall be paid.

Other sections of the engineers' schedule are generally similar to corresponding sections of the conductors' schedule. Some of the differences are the following: Under Section II, engineers called and released without performing service will be paid $3, and if held on duty more than two hours, they will be paid the minimum amount for the service called for. Paragraph (b) of this section reads: "Should a change of yard engineers occur during a shift by reason of sickness or other like emergency, the engineer relieved will be paid for the actual time worked at 95 cents per hour and the engineer relieving will be paid a minimum of $5.70." Section III is the same in the two schedules, except that engineers are paid at the rate of $1 per hour instead of 85 cents as in the case of the conductors. Section IV is likewise identical in the two schedules, except for the same difference in the rates of pay. Section V and Section VI are the same, except that the rate of pay in the engineers' schedule is $6 per day instead of $5.50. Sections VII and VIII in the two schedules are also alike, with the exception that paragraph (b) of Section VIII in the engineers' schedule calls for 50 cents higher pay than is provided for in the conductors' schedule. Sections IX of the two schedules are of a similar nature, except that there is an additional paragraph in this section of the engineers' schedule reading as follows: "Yard assignments shall be for not greater than an 8-hr. period. Except in cases of unforeseen necessities, yard crews will not be worked longer than 10 hr." Sections X and XI of the two schedules are the same.

Why the New Plans Are Proposed

The testimony of Mr. Deramus went into elaborate detail not only as to the plans themselves, but also as to the reasons why they are being proposed and as to events preceding the appointment of the fact-finding commission. Those portions of his testimony bearing upon the new schedules and the changes which they would effect in operating conditions and in the wages of conductors and locomotive engineers, are abstracted below:

The rules governing compensation of engineers and conductors have, in the course of years, developed into a very complicated and confusing situation. This is due in large part to the use of two measures for computing pay; one on a mileage basis, the other on a time basis, the employee being paid according to the measure which will produce the greater pay. Both methods are theoretically founded on an eight-hour day. The mileage system is based on the arbitrary assumption for freight engineers, for example, that a run of 100 miles should constitute a day's work, it being assumed that a freight train should run at an average speed of 12½ miles per hour, and thus cover a run of 100 miles in eight hours. Therefore, eight hours is the basic day in transportation service. But this eight-hour day is used, not for the purpose of placing an outside limit on the hours of work, but for the purpose of creating overtime and being paid for such overtime accordingly.

Out of this mileage basis of pay there have grown up many restrictions and penalties that have very little to do with the amount of time the crew is employed. One of the many rules providing for overtime, or extra compensation, is the "terminal detention" rule, or rules. There are also numerous restrictions as to the kind of work an engine crew may not do during its day's work without extra compensation or penalties for the doing of that work. Restricting and penalty rules, differing in details but similar in principle, govern conductors.

The complexity of the old schedules governing rates of pay, rules and working conditions of trainmen and enginemen has long been known to those who have had to make decisions involving questions arising under those schedules. The need for simplification has likewise been recognized not only by most railroad operating officers, but also by representatives of the public whose duties have made it necessary for them to give study to the subject. We think it will be generally conceded that the wage schedules of trainmen and enginemen are extremely complicated and difficult to understand.

Many such rules were made when the company operated a number of local freight trains and when switch engines were more commonly used at intermediate stations and terminals. But these local freight trains and switch engines at intermediate stations are no longer justified. It is doubtful if these restrictive and troublesome rules were ever fair to the company, but they are not now fair, and the various interpretations placed upon them over the years, and the constant efforts of organization representatives to expand them beyond their original intent, have made them still more troublesome and restrictive in more recent years.

As a result of the restrictions upon the class of work which conductors and engineers could or could not do, and the heavy penalties imposed for a departure from these restrictions, the company has been greatly hampered in the rendering of efficient and economical service. It is our belief that there is now no reasonable necessity for these dual measures of pay, or for these classifications, restrictions or penalties. The duty of the company is to render the most efficient service that can be performed economically, and the purpose of each employee should be to assist the company in such duty to the company, and the company should pay the employee a reasonable compensation for the service rendered in assisting the company in the performance of its duties.

Pay on Time Basis

Faced with these conditions and duties, the company has evolved a new plan for the payment of its conductors and engineers. In that plan it has proposed to pay these men on a simple time basis; that is, the men are to be paid for the time worked by them, at fixed amounts per hour, with the minimum fixed in the rate schedule, and when so employed, they are to perform such services as they are called upon to perform, with few classifications or restrictions, and no penalties. As a practical matter, the amount of pay received by the conductors and engineers will generally be not less, but more, than they are now receiving; their tasks will be no more difficult and their comfort and health no less safe than under existing conditions. And the company can give better and more economical service, can better meet competing transportation methods, and the existing trouble of timekeeping can be greatly reduced. The company and its employees will both be saved a great amount of time and expense, now wasted by reason of disputes as to the meaning of many of the existing rules, and the men and the company will be saved much "peace of mind" now lost in such controversies.

At this point I want to discuss some of the rules contained in the (old) trainmen's schedule and the (old) enginemen's schedule.

The basic day and overtime rules: According to these rules, payment for service performed is based on two measures and whichever measure affords the most pay is used in computing pay. These two bases are miles run and hours worked. If miles run in a day are less than 100, 100 miles are paid for; if more than 100, the wage increases proportionately. If hours worked are less than 8, 100 miles are paid for. If more than 8, and the mileage is 100 or less, the wage for the overtime increases at the rate of 3/16 of the wage for 100 miles, which is the time and one-half rate. When the mileage is more than 100, the 3/16 increase does not begin until the time on duty equals the miles run divided by 12½, the assumed rate of speed of the train. The foregoing applies to freight service. Passenger conductors' minimums are 150 miles, 7½ hr.; passenger engineers, 100 miles, 5 hr. This double basis of pay results in the employee having all the benefits of piece work, on the mileage basis, while retaining the benefits of a time basis of payment. The K. C. S. plan provides for payment on a time basis alone, with a liberal minimum allowance.

Onerous Rules

The classification and conversion rules: These rules provide for different rates of pay for different classes of service, such as passenger, through freight, local freight and work train service and, so far as enginemen are concerned, additional dif-

ferentials as between engines of various sizes. They also provide that when two or more classes of service are performed on a trip, the highest rate is to be used for the entire trip; and they further define what constitutes conversion from one class of service to another, to the extent that in some instances very slight services in one class tend to increase compensation; as, for instance, stopping one class of train enroute to permit track men to unload a car of gravel in a train, which is work of a more expensive class. Furthermore, yard crews are prohibited from performing road work except in emergencies; and when so used it is necessary to pay them twice for the same service. The K. C. S. plan provides for one rate for freight service and one rate for passenger service, with a liberal minimum allowance.

The terminal switching and terminal detention rules: In general, these rules restrict the performance of switching service at district terminals by road crews, and provide, when so used, for payment in addition to pay for the road trip, regardless of time, miles run, or total time consumed in such switching service or on duty. Some of these payments are at exorbitantly high rates. The rules also provide for arbitrary payments for detention on duty after arrival at terminals regardless of miles run or time on duty. These rules were largely the result of the mileage basis of payment and were intended to prevent working or holding road men at terminals to perform service at no additional cost, when the time on duty was less than the miles run divided by 12½. They have been practically eliminated from the K. C. S. plan, which provides for payment on a time basis entirely with good minimums.

The starting time rules: Under these rules, the company is prohibited from requiring yard enginemen, who are assigned to regular jobs, to start work at times other than between specified hours of the day or night. For example, under certain conditions, a man may not be required to go to work except between 6:30 and 8:00 a.m.; 2:30 p.m. and 4 p.m.; and 10:30 p.m. and midnight; under other circumstances, the permissible hours for starting are 6:30 a.m. and 10 a.m. and not later than 10:30 p.m. In still other circumstances, leeway between 6:30 a.m. and 12 midnight is given. The company's service would often be served with more efficiency, economy and dispatch by starting yard enginemen to work during prohibited hours, and the K. C. S. wage plan affords this privilege.

Side and lap-back trip rules: It is sometimes necessary for a train and engine crew, in the course of their trip, to go back over a portion of the road to get a car, or for some reason or other, and then proceed on as originally intended. This is known as a lap-back trip. A side trip is similar to a lap-back trip, but instead of covering the same territory previously covered, the trip is made on a branch line which is not on the regular territory of the train. The rule provides that when emergency side or lap-back trips are made, the miles will be added to the mileage of the regular trip and paid for accordingly. This has been interpreted to mean that when no actual emergency exists, such as derailment, engine failure, track obstruction, etc., the crew must be paid a day's pay for the side or lap-back trip, in addition to the pay they would have received had such movement not been made. The penalizing effect is readily apparent. Under the K. C. S. plan, the conductor and engineer are paid for all time on duty, at good rates of pay with reasonable minimums.

[At this point, Mr. Deramus cited numerous specific examples of burdensome conditions imposed by the old rules and explained how the new rules would apply to similar situations.—Editor.]

Simplicity the Object

The purpose of our plans is to simplify the rates of pay and rules and working conditions under which the men work and are paid, and to give the management more freedom in the use of its organization and facilities without the prohibitive penalties accompanying such use. At the outset in our study of the situation, we found that it would be necessary to get away from the mileage basis of payment for road work if we were to be able to justify the omission of certain complicated rules such as the terminal delay and terminal switching rules. So we adopted the general idea of a time basis of payment for both conductors and engineers and did so entirely for the purpose of simplifying the whole scheme of payment surrounding the service of these classes of employees. The K. C. S. plans are drawn up on this basis, except that trip rates have been set up for passenger conductors.

We have at present only one passenger train in each direction daily, and these trains, over the entire line, are manned by a total of 10 passenger conductors, so that, in reality, these trip rates affect only a very small number of employees. The rates, however, have been set high enough so that they will afford some increases in pay to these men over the present rates less the 10 per cent reduction in pay now in force, and an additional payment of 50 cents is to be made for each 30 minutes beyond the hours specified for each trip. Under the old agreement, overtime would not accrue on these runs until after 16 hr. 51 min. on the Kansas City-Heavener straightaway run; 18 hr. 33 min. on the run via Ft. Smith; 11 hr. 9 min., Heavener to Shreveport; 9 hr. 12 min., Shreveport to Lake Charles; and 10 hr. on the DeQuincy-Port Arthur run.

For extra passenger service, we go to the time basis of payment, and we do the same for all other classes of service for both conductors and engineers. Under our plan, we first establish a minimum sum to be paid for a minimum period of service, and then specify a rate of so much per hour thereafter. We have departed entirely from miles run as a basis for payment, and this is one of the principal differences between the method of payment under the old agreements and under the K. C. S. wage plans.

Another outstanding difference between the old agreements and the K. C. S. wage plans, is the absence in our plan of any reference to what is known as a basic day. The old trainmen's agreement says that, in passenger service, 150 miles or less will constitute a day; and in all road service except passenger, 100 miles or less, 8 hr. or less (whichever produces the greater reward) shall constitute a day's work. The old enginemen's agreement says that 100 miles or less, 5 hr. or less, constitutes a day's work in main line passenger service, and 100 miles or less, 8 hr. or less, constitutes a day in all classes of freight service.

Instead of the 5-hr. day for passenger engineers and the 7½-hr. day for passenger conductors and the 8-hr. day for road freight and yard service in the old schedules, our plan contemplates trip rates for passenger conductors and minimum allowances for 3 hr. or 4 hr., as the case may be, in other classes of road service for both conductors and engineers, and a minimum allowance for 6 hr. service for yard engineers.

No Punitive Overtime

Another feature of the old agreements which we do not have in the K. C. S. wage plans is a punitive overtime rate. The old agreements provide that in freight train and engine service, also in yard service, overtime is paid for on the basis of time and one-half. Passenger overtime is on a pro rata basis. The K. C. S. wage plans provide, as before indicated, for a stated hourly rate beyond three hours in passenger service, four hours in freight service and six hours in yard service. These hourly rates are much higher in practically every instance than the pro rata hourly rates set up in the old agreements, but not as high as the time and one-half rates.

Another very distinct departure from the old agreements is the elimination of a variety of rates for road freight conductors and engineers, based on the class of service in which engaged, and further separations for engineers on the basis of the size of the engine used. Under the old trainmen's agreement, there is a rate set up for a conductor in through freight service; another for local freight service and another for work train service. The K. C. S. plan provides for one rate to apply to all such service. The old enginemen's agreement provides 13 separate rates, according to the size of engine, for engineers in passenger service; 11 separate rates, according to size of engine, for through and irregular freight, helper, transfer, work and wreck train service; 11 separate rates, according to size of engine, for local, dodger and combination yard and road service; and 6 separate rates, according to size of engine, for yard service. The K. C. S. plans provide for one rate to apply to all passenger service, one rate to apply to all road freight service and one rate to apply to all yard service. The simplification in timekeeping that will result from this arrangement will, we believe, be readily apparent.

Another departure from the old schedules is the elimination of the complicated terminal detention and terminal switching rules. Although extremely objectionable, the complexity of these rules is not, by any means, the principal objection we have to them. Our principal objection lies in the fact that, so far as we understand them, they restrict and hamper us in our efforts to make full use of our organization and facilities and, in addition, they impose extreme penalties for using crews to perform a few minutes' work which, in the very nature of things, ought to be performed by such crews as a part of their regular duties, so as to enable the company to render reasonably satisfactory service to its patrons without incurring excessive penalties.

In working out the K. C. S. plans, we have gone along to a considerable extent with a number of the rules of the old agreements, although in modified form, as for instance, rules covering cases of men being called and not used; men held away from home terminals; men tied up between terminals; men used in or held for special service; men attending court;

men deadheading; men first in—first out of terminals; and the handling of grievances. Section XI of our K. C. S. plans says that seniority rights of employees will be fully respected, and no change in such rights will be made except by written agreement with their duly authorized representatives. In the next sentence of that section, we say that regulations covering the acquirement and exercise of seniority rights and the increasing or decreasing of pools, boards, etc., will be promulgated by the general manager as a result of conference with the duly authorized representatives of the employees.

We believe it to be in the best interests of both the company and the employees to have a certain flexibility in rules and regulations as applicable to various divisions and districts of the railroad, while at the same time retaining intact what we have termed the wage schedule. Many of the rules in the old joint agreements covering bidding in of runs, regulation of pools, etc., are not being handled strictly according to the wording of the rules on some districts, because the employees on those districts through their representatives have indicated that they wish to have such matters handled on a different basis. There is, in each such instance, a technical violation of the agreement, which is not a desirable situation. Of course, a separate agreement could be drawn up to take care of each such situation, but, technically, every time such a change is made, the entire wage schedule would be opened up for revision.

We conceived it to be a much more desirable plan to have the regulations entirely separate from the formal wage schedule and thus subject to change after informal conferences; also, that deviation from these regulations on any division or district, or at any individual point, may be made by special written agreements between the superintendent and the local chairman, when approved by the general manager and the general chairman.

Effect on Employment

The question has been raised in our several conferences with the organizations, also in mediation, as to what effect the K. C. S. wage plan would have on the unemployment situation. We, of course, cannot definitely answer this question because we have not had actual experience in its operation, but we are of the opinion there would not be any great change one way or the other.

The representatives of the Brotherhood of Railroad Trainmen have indicated it to be their opinion that the K. C. S. wage plans for employees in road service would have the effect of reducing the number of yard crews employed. On the other hand, our wage plan for engineers contemplates the right to work these men six hours per day in yard service for six hours' pay, but at a higher hourly wage than they are now receiving for eight hours' service. It seems to us that, if this feature were extended to all men in yard service, it would naturally result in the employment of more men, thus spreading the available work over a larger number of employees.

However, as a matter of fact, with business continuing to pick up, it is quite likely that additional men will be required to handle it. In other words, we look for a continued improvement of the situation, so far as employment is concerned, and we believe that our wage plans will assist in this improvement.

[At this point, Mr. Deramus gave a detailed analysis of the pay of engineers and conductors under the new wage plan as compared to the old agreement. These showed that, based on operations in October, 1932, and in the first four months of this year, the increased compensation for conductors under the new plan, for these five months, would have amounted to 13.63 per cent. Engineers in road service for the five months would have had increased compensation of 5.16 per cent; and engineers in yard service, increased compensation of 9.64 per cent.—Editor.]

Restrictive Rules Hamper Railways

As everyone knows, competition in the railroad field has been gradually growing more and more acute for several years, and during the past two or three years this competition, coming at a time when railroad revenues have been so seriously diminished by reason of the depression, has necessitated extreme activity on the part of railroad managements in efforts to make both ends meet. In the face of these almost insurmountable difficulties, all railroads have had to contend with the many restrictive rules of the old agreements which have hampered the railroads in the proper use of their facilities and have imposed such severe penalties as to make much of such use prohibitive, and they have interfered greatly with our ability to compete with other kinds of transportation.

In the very beginning, we realized that to solve these problems we must get away from the dual time and miles basis of payment. We realized, also, that in making this change, it would be necessary for us to proceed cautiously, and strive to pay our employees amounts which would compensate them, as a whole, as well or better than they had been compensated under the old rules. Our first computations were based on an effort to break even, insofar as total compensation was concerned. Later we added to the rates and changed the minimum here and there so as to take care of possible fluctuations from month to month.

Furthermore, it has been our observation that conductors do not receive as large a proportion of the total earnings of the crew as they should receive, and, so far as conductors are concerned, we raised their rates so as to make up that deficiency. It is possible that we have the rates too high. Experience will tell whether or not that is the case. If it develops that they are too high, we expect to take steps to correct them after a fair trial. On the other hand, if it develops they are too low, we expect to undertake to correct that situation.

We believe it unwise to be bound by precedent in matters of this kind. The management is vitally interested in the welfare of its employees, because it is clear that contented employees have much to do with the success of any institution. On the other hand, no institution that is fettered by red tape and uselessly restrictive regulations and practices can properly and economically serve the public in the face of the relentless competition that is upon us in this day and age. In short, we want more freedom to utilize our facilities and our organization to the best advantage, but at the same time we intend to fully protect the earnings of our employees in the process of gaining this freedom.

New Books...

Educational Experiments in Industry, by Nathaniel Peffer. 207 pages, 7½ in. by 5 in. Bound in cloth. Published by the Macmillan Company, New York. Price $1.50.

This book affords a cross-section view of educational methods pursued by industrial companies in the training of their employees, being both a factual presentation of what has been done by a large number of firms, and, in some measure, an appraisal of such work. Among numerous examples, outlining existing industrial plans, some of which cover instruction along purely cultural lines, as well as along the far commoner lines of training on the job for the job, is included a description of the plan sponsored by the Railway Educational Bureau, which was founded by E. H. Harriman to take over the training of Union Pacific employees but which has been operated since 1913 by D. C. Buell. Further along—in his discussion of "The Public School and Industry"—the author shows how New Jersey's state and county facilities for vocational training meet special needs arising among the industries of the state, citing in this connection the series of special lectures arranged in 1928 to aid in such retraining of railway employees as was required when large sections of some railroads in New Jersey were converted from steam to electric operation.

The Development of American Industries, planned and edited by John George Glover and William Bouck Cornell. 932 pages, 9 in. by 5¾ in. Illustrated. Bound in Cloth. Published by Prentice-Hall, Inc., New York. Price $6.

This volume, issued upon the occasion of the 100th anniversary of the founding of New York University and dedicated to the memory of that institution's founders, presents in convenient form a cross-sectional view of 39 principal American industries. Beginning with a chapter on "Labor's Contribution to American Industries," by the American Federation of Labor, William Green, president, the work proceeds through 28 subsequent treatises on various industries, to Chapter XXX, The Railroad Industry, by the New York Central Lines, P. E. Crowley, until recently their president. This latter discusses the evolutionary growth of transportation, the development of American railroads, their economic significance to American commerce, their present status, their comparison with other industries and important railroad legislation. In addition to the foregoing, and the chapters on the automobile industry, the shipping industry, the aeronautical industry and the travel business, which will be, perhaps, of special interest to railway men, the work as a whole should become a valuable handbook for freight traffic officers in their endeavors to understand the nature and problems of industries which their railways serve.

Odds and Ends . . .

Modern Rate Making

Thanks to Roy M. Edmonds, secretary-treasurer of the Railway Tie Association, we have had some sardonic amusement from a classified advertisement in a St. Louis newspaper which affords an excellent example of how rates for the transportation of freight are made in this enlightened day. The advertisement reads: "Large van going to Little Rock, Ark.; another van to Pittsburgh, Pa.; will bring return loads to St. Louis or any point this way; your price."

Why Don't They Do This with All the Railways' Surplus Locomotive Power

The first locomotive ever to be used in the manufacture of beer was working 24 hr. a day at the plant of the Hazelwood Beverage Company, Pittsburgh, Pa., last month. With orders on hand exceeding the capacity of the plant, an auxiliary source of steam had to be secured. A Baltimore & Ohio locomotive was leased for the purpose, and from all reports, it did its job well.

Cotton in Railway Service

National Cotton Week was celebrated in a whole-hearted fashion by the railroads of the country, with menus printed on cotton cloth in common use on dining cars. The Missouri-Kansas-Texas printed its menus in blue ink on heavy stiffened cloth with a picture visualizing the slogan, "Everybody Uses Cotton," on the title page. Starched cotton fabric was also used for the menu card of the Illinois Central, which was printed in yellow and black on the unglazed side of the fabric. On the Seaboard Air Line, the menu included a miniature reproduction of the official poster, with one full page devoted to the story of cotton. Eight-page folders of blue fabric were used by the Southern and the Texas & Pacific, while the New York Central had miniature Cotton Week posters printed in blue on cotton cloth attached to all its menu cards.

Heroic Orphans Rewarded

Virtue was not its own reward in the case of six orphan boys who, during a terrific thunderstorm near Passaic, N. J., discovered a washout on the Erie tracks and flagged an Erie commuter train 50 ft. short of destruction. A few nights later, they came down to dinner to find John McGlin, engineer of the Erie train which they had saved, on hand to express his thanks in person, and S. Castagnola, an officer of the Lionel Corporation, manufacturers of miniature electric trains. On behalf of the Lionel Corporation, the boys were presented with a complete miniature railroad, with not one train but three, and with complete equipment, including switches, signaling devices and miniature stations and other buildings. Nor was that all. When the Erie Limited left Jersey City on June 26, it had among its passengers the same six boys, traveling as special guests of the Erie management. Personally conducted by C. C. Howard, passenger traffic manager of the railway, they were taken to Chicago for a week's visit at the Century of Progress Exposition.

Traveling Hospital on Canadian National

A traveling hospital has been put into service on the lines of the Canadian National in Northern Ontario between North Bay and the Manitoba boundary. It will serve a huge territory that has hitherto been without hospital facilities of any kind. The hospital consists of a car, especially designed by the railroad and turned over by it to the Red Cross for maintenance. The Red Cross has provided the personnel of the car and the railroad moves it from point to point without charge. The car is 75 ft. long and contains a fully-equipped hospital ward with three beds, in addition to sleeping quarters for the nurses and an operating room completely equipped for hospital and clinical work. This was not the first instance of social service performed by the Canadian National. For several years the railway has co-operated with the Ontario government in handling a traveling schoolhouse which moves from point to point in the North, bringing education to children who would otherwise be without facilities for schooling. In addition, a first-aid instruction car is maintained by the Canadian National which travels through the territory, carrying instructors who give lessons in anatomy and in first aid to all who wish to avail themselves of the privilege.

Lackawanna General Paymaster Retires

Frank N. Hallstead, general paymaster of the Delaware, Lackawanna & Western at Scranton, Pa., retired on July 1, after 53 years of continuous service in the paymaster's department, leaving behind him a record which is probably without parallel. During his 53 years on the Lackawanna, Mr. Hallstead disbursed $1,169,390,576.39 to employees of the railroad and its affiliated coal mining interests. More than 25,000,000 pay checks were used to make these disbursements. According to the publicity department of the Lackawanna, if the amount of money paid by Mr. Hallstead to Lackawanna employees were laid end to end in dollar bills, they would extend for 116,939 miles. We are taking their word for it.

He Knew What He Wanted

At the testimonial dinner given by 400 officers and employees of the Central of New Jersey in honor of Roy B. White, on the eve of his retirement from the presidency of the Jersey Central to assume the presidency of the Western Union Telegraph Company, R. W. Brown, vice-president and general manager of the railway, took advantage of the opportunity to tell a story in which both he and Mr. White were involved. It seems that some years ago Mr. White was superintendent of the Indianapolis division of the Baltimore & Ohio and Mr. Brown was a locomotive engineer on the same division. A change had been made in freight train operation on the division, and as a result the performance of one particularly important freight train was being observed very closely. Several changes had been made in the schedule of this train and in the tonnage which it handled. On a trip after one of these changes, with Mr. Brown at the throttle and with the trainmaster also on board, McGonigle Siding was passed when the train had insufficient time to clear properly the schedule of a following passenger train, No. 38, at Donold Siding, and there was a delay of three minutes to the passenger train. Little realizing that anyone other than themselves had observed the performance, Mr. Brown and the trainmaster were much surprised to receive a telegram before leaving the siding. The telegram read, "Why was train 38 delayed?" and was signed "R. B. W." The trainmaster, as trainmasters will, handed the message to Mr. Brown with the remark, "Buddy, you are the engineer; you answer it". Mr. Brown did so, saying that the train was heavy and handled hard on the Oxford grade. At Cottage Grove, another message was received stating, "Your experience and knowledge of train handling should have taught you this would have occurred. Why was train 38 delayed?" A reply was sent to the effect that "We thought we had sufficient time leaving McGonigle to clear No. 38 at Donold, but as previously advised, etc." At Connorsville, the trainmaster handed Mr. Brown a third telegram, reading, "It is not yet clear to me why No. 38 was delayed—R. B. W." At this point the trainmaster said, "Buddy, when you have known this man as long as I have, you will understand that when he asks a question he knows about what the answer should be, and will continue asking questions until such answer is received. Now tell him the facts." Mr. Brown's message in reply was, "We knew when we left McGonigle that we had insufficient time to clear No. 38, but risked a minor delay to a local passenger train to prevent a more serious delay to this important freight train." Promptly the reply came back: "O. K.—R. B. W."

NEWS

Annual Meeting of Medical Section

That the railroads, through periodic and other medical examinations, are prolonging the lives of their employees and are reclaiming, by medical treatment, thousands who otherwise would have to be retired from active service, was shown at the thirteenth annual convention of the Medical and Surgical section of the American Railway Association at Chicago on June 26 and 27. This improved condition, according to a report submitted by Dr. Sterling B. Taylor, chief surgeon of the New York Central and chairman of the Committee on Developments Resulting from Periodic Examinations, not only greatly benefits the employees and their dependents, but also is an important factor in increasing safety and efficiency on the railroads.

"Our committee finds," said the report, "that the greatest benefits shown have been in the handling of cases involving diseases affecting the heart. For instance, all of us have seen men formerly efficient who became 50 per cent inefficient, without reference to loss of time, and these men, when caught sufficiently early and the focal cause removed, were returned to efficiency in the capacity to which they were assigned, thus insuring a decrease in accidents. Particular attention has been paid to the economic side of the employee's life by not putting him into the discard, but by transferring him to some less hazardous and stressful occupation, thus allowing him to continue as a wage earner. Railroad companies that require periodic medical examinations have extended every means of making a correct diagnosis to enable the employee to secure the best medical care. We assert that the period of good health and efficiency of employees coming under a periodic survey has been increased by eight years, if we are to believe our own records.

"We call attention to the fact that at the end of 1930, the average age of 1,215,000 employees of 129 Class I railway systems was 43 years. The obvious result produced by these examinations has been not only to increase materially the efficiency of employees, but also to reduce accidents.

"In the interest of employees and the public as well as the company, certain classes of employees have been subjected to re-examination periodically, and from such periodic examination the physical condition of employees has been ascertained. By having this information, we have been able to discover incipient diseases and to recommend prompt and proper treatment, resulting in the extension of expectancy of life and restoration of health in many instances. Today, we are receiving the benefits of retaining in employment old and competent employees who would have been put into the discard had it not been for this watchfulness."

Among the speakers at the meeting, over which Dr. John McCombe, chief surgeon of the Canadian National and chairman of Section, presided, were: Dr. H. S. Cumming, surgeon general of the United States Bureau of Public Health Service; R. H. Aishton, chairman of the board of the American Railway Association; F. W. Sargent, president of the Chicago & North Western; Dr. W. A. Evans, writer and health editor of the Chicago Tribune; and Dr. Herman N. Bundesen, commissioner of health of Chicago.

Officers elected for the ensuing year are: Chairman, Dr. W. L. Hartman, chief surgeon of the Michigan Central; first vice-chairman, Dr. J. R. Nilsson, chief surgeon of the Union Pacific; and second vice-chairman, Dr. J. R. Garner, chief surgeon of the Atlantic & West Point and the Western Railway of Alabama.

Railways and Salesmanship—A British Viewpoint

You have got to sell more business. You have got to alter the railway outlook, so that your salesman has to be just as good a drummer as the man who sells shaving soap. He has got to regard everybody who comes to the station as a valued customer and treat him as such, and he must not turn round and say, "Take it or leave it."

It has to be courtesy and service all the time and service first as far as railways are concerned. We must have a sales manager. If he says, "If you will give me a train service from A to B with a frequency of so much I can sell 10,000 tickets"—that is his job; or if he wants to put on so many day excursions, that is his job. All the operating manager has to do is to provide the service. We hold our chief commercial manager responsible for selling our railway service.

E. J. Lemon, O. B. E., Vice-Pres. (Operation and Traffic) of the London, Midland & Scottish, in an address to the Canadian Railway Club.

Johnston Wins B. of L. E. Fight

Alvanley Johnston, grand chief engineer of the Brotherhood of Locomotive Engineers, has been re-elected to that post. A determined effort was made by a self-styled "progressive" faction within the brotherhood to unseat Mr. Johnston, on whom they endeavored to place the blame for some of the brotherhood's difficulties which arose out of its excursion into finance which was undertaken under the regime of the late Warren S. Stone.

July 4 Traffic Heavy in Middle West

One of the heaviest movements of passenger traffic in the Middle West in recent years was recorded on the week-end of June 30 to July 4, when the 22 railroads operating passenger service into Chicago transported approximately 80,000 passengers into the city on the five days. This movement was stimulated by the low rates offered by the railroads and by the Century of Progress Exposition. It follows heavy movements on June 17-18 and June 24-25. The largest portion of the traffic came from the East and was brought in by the Pennsylvania, the New York Central and the Baltimore & Ohio. These railroads ran their trains in several sections with as many as 18 cars to a section. The Pennsylvania and the New York Central each carried 7,000 passengers on July 2. During the five days, the Pennsylvania operated 60 extra sections, while its entire movement required 1,000 extra sleeping cars and coaches.

The New York Central, like the Pennsylvania, for the third consecutive Sunday, set a new record for the season, the passengers carried into Chicago totaling 4,723 on June 18, 5,673 on June 25 and 7,573 on July 2. The Exposition Flyer from Boston and New York on July 2 was run in eight sections and carried 1,985 passengers into Chicago.

The Baltimore & Ohio, besides operating several extra trains, ran the Capitol Limited in four sections on July 2. On June 18 it had three sections, and on June 25 seven.

Arrivals on the Illinois Central on July 1 to 4 totaled 8,419 passengers, requiring 111 extra coaches and 61 extra sleeping cars. There were seven extra sections of regular trains and one special train. The revenue received from this special business totaled $75,000.

One of the most interesting features of the Century of Progress movement is the large number of Texans taking advantage of the low rates, a total of 22 tourist sleeping cars being parked on Illinois Central tracks for their accommodation during the week-end. As a further convenience, baggage cars were equipped with showers for use by the occupants of the cars.

Mobilization of Forest Army Completed

The Civilian Conservation Corps has announced the successful completion by July 1 of the mobilization of the 274,375 men enrolled in reforestation camps throughout the country, a large part of which was carried on with the aid of the Troop Movement Section, Car Service Division, of the American Railway Association. The rail movement included the handling of 64,196 men in 211 special trains of 1,605 sleeping

cars and coaches, of which 55,130 were moved to the far West. In addition over 200,000 men were moved partly by rail and partly by bus to work camps in the vicinity of the points of enrollment.

Northwest Shippers' Board

The Northwest Shippers' Advisory Board will hold its regular meeting at Aberdeen, S. D., on Tuesday, July 25.

Hearing on Private Freight Cars

The Interstate Commerce Commission has announced a hearing to be held at Chicago beginning on July 31 on the subject of private freight cars, as part of its general investigation in Ex Parte No. 104, before Director W. P. Bartel of its Bureau of Service.

Emergency Freight Rates Continued in New York

The Public Service Commission of New York State has authorized the continuance, within the state, until September 30, 1933, of the emergency surcharges in freight rates. This corresponds to the action taken by the Interstate Commerce Commission and is an extension of the permission heretofore granted to keep the rates in effect until May 15. Shipments of manufactured fertilizer and animal and poultry feed are excepted.

May Locomotive Shipments

May shipments of railroad locomotives from principal manufacturing plants, as reported to the Bureau of the Census, United States Department of Commerce, totaled one locomotive as compared with one in the previous month and 15 in May, 1932. Unfilled orders at the end of May totaled 69 locomotives (three steam and 66 electric) as compared with unfilled orders for 146 (13 steam and 133 electric) at the end of May, 1932. The foregoing figures do not include data on locomotives built by railroads in their own shops.

Trustee Panel Enlarged

Following the filing of a reorganization petition by the Chicago, Rock Island & Pacific the Interstate Commerce Commission has added the following names to its panel of standing trustees from which appointments may be made by the federal courts: James E. Gorman, president of the Rock Island, Rush Butler, Walter Fisher, Jr., Joseph B. Flemming, Cornelius Lynde, Amos C. Miller, and Charles M. Thomson, of Chicago, John G. Lonsdale, of St. Louis, Mo., and Wayland W. Magee, of Omaha, Nebr.

Eastern Car Foreman's Association Outing

The first annual golf tournament and field day of the Eastern Car Foreman's Association will be held on Thursday, July 20, at the Race Brook Country Club, New Haven, Conn. J. P. Egan is president of the association and F. H. Becherer is general chairman of the outing committee. The program will include a golf tournament open to members and guests, putting contests for golfers and for non-golfers, field events for non-golfers, bridge and a quoit contest. Prizes will be awarded to winners of each event. Transportation has been arranged for on a special one-day excursion trip on the New York, New Haven & Hartford from New York and from Boston, Mass., including transportation from station to and from the Golf Club.

G. M. & N. Using I. C. to Paducah

The Gulf, Mobile & Northern has concluded an operating agreement with the Illinois Central, whereby it runs through freight trains over the Illinois Central between Jackson, Tenn., and Paducah, Ky., instead of over the Nashville, Chattanooga & St. Louis as has been done since 1926. The G. M. & N. is continuing to use jointly with the Chicago, Burlington & Quincy and the N. C. & St. L. the same terminal at Paducah as heretofore. The new route results in operating economy and improved schedules as it is 32 miles shorter.

Transportation of "Hot Oil" Prohibited

By virtue of the authority vested in him by a provision in the national industrial recovery act, President Roosevelt on July 11 issued an executive order prohibiting the transportation in interstate and foreign commerce of petroleum and its products produced or withdrawn from storage in excess of the amount permitted to be produced or withdrawn from storage by any state law or valid regulation or order prescribed thereunder, by any board, commission, officer, or other duly authorized agency of a state.

Equipment Installed

Class I railroads of the United States in the first five months of 1933 placed in service 1,249 new freight cars, according to the Car Service Division of the American Railway Association. In the same period last year, 1,671 new freight cars were placed in service. The railroads on June 1 had 1,205 new freight cars on order compared with 2,534 on the same day last year. The railroads placed one locomotive in service in the first five months this year compared with 22 in the same period in 1932. New locomotives on order on June 1 this year totaled one compared with 18 on the same day last year.

Baggage Rules Relaxed

The New York Central has eliminated from its baggage tariffs the rule forbidding agents to check empty trunks. Also, orders have been issued to charge for storage of only one parcel where two or more small packages, or an umbrella and suitcase, can be securely fastened together.

Other recent changes in baggage rules include the following:

Elimination of deposit of 50 cents for missing duplicate checks. Free transportation of golf clubs, fishing tackle, football and baseball material, snowshoes, skis, etc. Free storage of baggage received at any hour Saturday until midnight Monday. Accepting sample baggage in boxes. Cancellation of the charge of 25 cents when passengers neglect to check baggage, and ask that it be ordered forward. When redeeming tickets on which baggage has been checked and the passenger did not travel, the regular excess baggage rate will be charged, instead of twice the regular rate. Acceptance of baggage in cardboard boxes.

G. W. R.'s Former American Agent Heads Publicity Department

G. E. Orton, formerly general agent in America of the Great Western and Southern Railways of England, has been appointed publicity agent of the Great Western with headquarters in London. He succeeds K. W. C. Grand, also a former general agent of the company in America, who has been appointed commercial assistant to the superintendent of the line. Mr. Orton entered the service of the Great Western in the publicity department in 1903. In 1926 he was appointed assistant publicity agent. In 1929 he came to New York as general agent, returning to England as assistant commercial advertising and publicity agent in 1932. Mr. Orton was the originator of the "mystery excursions" which were first run on the Great Western and which have since been offered by railways in many countries.

Philadelphia Commutation Rates Reduced

The Pennsylvania and the Reading, effective July 1, inaugurated new forms of commutation tickets for travel between Philadelphia, Pa., and surrounding territory. The plan involves a reduction of 10 per cent in commutation rates and the introduction of monthly 50-trip tickets, at a reduction of about 11 per cent from the previous price of the regular 60-trip monthly tickets, for the accommodation of part-time workers who have found themselves unable to liquidate the 60-trip tickets within the time limit. Other innovations are a 25-trip ticket with a three-months time limit and a 60-trip ticket with a six-months time limit.

Benefits From New Railroad Legislation Seen Already

Although the federal co-ordinator of transportation, Commissioner Joseph B. Eastman, has not yet completed his organization, Postmaster General Farley has found benefits already from the new legislation under which he was appointed. In an address at Greensboro, N. C., on July 6, in a review of the legislative accomplishments of the new administration at Washington in which the Postmaster General is understood to have played an important part, he said: "The intolerable railroad situation, resulting in deficits and federal receiverships, has been relieved by a system of railroad control headed by a federal co-ordinator of transportation, and, although not yet in full effect, has resulted in benefits to the transportation lines, many of which are showing net earnings against previous deficits."

Delaware & Raritan Canal

The Delaware & Raritan canal, the ancient waterway between Bordentown, N. J., on the Delaware river and New Brunswick, on the Raritan river, 44 miles long, has not been opened for business this year,

and the United New Jersey Railroad & Canal Company, the owner, is ready to make a gift of the whole property to the state of New Jersey. The canal has been kept in order at a loss for many years. General W. W. Atterbury, president of the Pennsylvania, which is the lessee of the United New Jersey Railroad & Canal Company, has written a letter to the legislative committee which is considering the canal problem, offering to relinquish all rights on condition that the railroad retain the right to cross and recross the canal, and to use for railroad purposes any of the property not required for canal purposes; the state to agree that otherwise the property shall not be used for railroad purposes. The Pennsylvania already has offered a short section of the canal to the city of New Brunswick for sanitary sewage disposal purposes.

Southern Regional Co-ordinating Committee Chosen

Selection of regional co-ordinating committees to represent the railroads in accordance with the provisions of the Emergency Transportation Act of 1933 was completed on July 6 when the representatives of the Southern roads were chosen. The personnel of the Eastern and Western committees was given in last week's *Railway Age*.

Members of the Southern Regional Co-ordinating Committee are: W. R. Cole, president of the Louisville & Nashville; L. A. Downs, president of the Illinois Central; G. B. Elliot, president of the Atlantic Coast Line; Fairfax Harrison, president of the Southern; and L. R. Powell, receiver for the Seaboard Air Line.

Meanwhile the Eastern Committee has established headquarters at 143 Liberty street, New York, and has appointed as its executive secretary, M. C. Kennedy, former chief railroad examiner for the Reconstruction Finance Corporation. It has also selected a law committee as follows: Jacob Aronson, general counsel, New York Central; H. W. Bikle, general counsel, Pennsylvania; J. J. Cornwell, general counsel, Baltimore & Ohio; Herbert Fitzpatrick, vice-president and general counsel, Chesapeake & Ohio; and E. G. Buckland, chairman of the board, New York, New Haven & Hartford and president of the Railroad Credit Corporation.

Several of the foregoing attended a meeting of the Eastern committee in New York on July 11. On July 14 the committee met in Washington with Federal Co-ordinator Joseph B. Eastman.

Increasing Passenger Travel on the Pennsylvania

A. H. Shaw, general passenger agent of the Pennsylvania's New York zone, reports a steadily mounting passenger business on the Pennsylvania system to Long Island and New Jersey seashore resorts, also to Washington, D. C., and Chicago. On July 9 the Long Island Railroad carried 107,208 passengers to and from the beaches, an increase of 14 per cent compared with travel to the beaches the same day in 1932. Other trains also carried large numbers of week-end travelers. During three days of last week, the Pennsylvania operated an extensive train service to North Jersey resorts, with an increase in passenger business of 12 per cent over the same three days of last year.

Every week-end several extra trains are run between New York and Atlantic City, to accommodate the people who visit that resort. Travel on the Pennsylvania between New York and Chicago, also to other western points, is increasing from week to week, requiring the operation of many extra trains and the addition of Pullman sleeping cars to regularly scheduled trains, mostly for the accommodation of persons visiting the Century of Progress International Exposition, in Chicago.

In conclusion, Mr. Shaw stated there are two principal reasons for the growing use of railroad transportation; first, because fares have been adjusted downward to such a marked degree that the safety, speed, comfort and convenience which steam and electric train service provides, irrespective of weather conditions, may be enjoyed by an infinitely greater number of persons than heretofore, and, second, because travel has been stimulated as the result of President Roosevelt's program for business recovery, which contemplates the re-employment of millions of individuals.

Railway Employment Increased in June

An increase of 20,227 in the number of railway employees in service between the middle of May and the middle of June is shown in the Interstate Commerce Commission's report for the latter date. This brought the total for Class I railways excluding switching and terminal companies to 957,330, a decrease of only 7.15 per cent as compared with the number in June, 1932, whereas in previous months the number has been running 12 to 14 per cent less than last year's figures. The principal increase was in the group of train and engine service employees, 194,431, which was 1.39 per cent greater than the number in June, 1932. The number of maintenance of way and structures employees was 11.57 per cent less. The number of employees in May, 937,103, is the number which, under the provisions of the law under which the federal co-ordinator was appointed, may not be reduced by reason of any action taken pursuant to the authority of that law, after deducting not to exceed 5 per cent for normal retirements, deaths or resignations; but the number is to be calculated for each road.

Class I railways, excluding switching and terminal companies, reported to the Interstate Commerce Commission a total of 925,485 employees as of the middle of the month of April. This was an increase of 5,604 over the number reported by the same roads for March. The April record was 13.46 per cent less than that for the same month of the preceding year. The commission's report also notes that 1,029,180 employees were reported as having received some pay during the month either for full time or part time. This number is 4,842 smaller than the corresponding total for March, 1933. Because of the fewer number of working days in April than in March, the total compensation paid in April, $107,403,704, was less than that for March but the number of hours paid for per working day was 3.7 per cent greater in April than in March.

Call for Architects and Engineers to Participate in Federal Program

Private architects and engineers throughout the country will be engaged by the U. S. Treasury Department to prepare the plans and specifications for a large federal building program which may reach a total of $200,000,000. L. W. Robert, Jr., assistant secretary of the treasury, has adopted this policy in order that professional men who have not had employment will benefit by the large expenditure for new federal buildings, the design and construction of which come under the authority of the Supervising Architect's Office of the Treasury.

For the purpose of spreading employment as far as possible among architects and engineers who, preferably, have had some previous experience in public building work, Mr. Robert has requested the co-operation of American Engineering Council and the American Institute of Architects in enrolling qualified individuals and firms. His purpose is to engage on every building architects and engineers resident in the State in which it will be erected.

The Treasury Department, with the co-operation of the American Institute of Architects, is assembling the records of architects throughout the country and the American Engineering Council has been requested by Mr. Robert to compile state lists of engineers and engineering firms that customarily engage in construction of buildings of the monumental character usually typifying those built by the federal government. Any qualified engineer desiring to participate in the Treasury Department's building program should send to L. W. Wallace, executive secretary, American Engineering Council, 744 Jackson Place, N. W., Washington, D. C., a complete statement, in duplicate, of his professional record, with a citation of significant references.

Notes on the Fair

A ten-foot, aluminum model of the Union Pacific high-speed, lightweight, stream-line passenger train is now being exhibited in the Chicago & North Western booth at the Century of Progress Exposition.

The Illinois Central, on July 2, supplemented its Century of Progress Exposition service with 34 additional electric trains to carry the increasing number of passengers going to and from the gates of the Fair. The number of passengers handled by the Illinois Central in this service passed the million mark on July 1. World Fair stations now have a train each way on an average of every 10 min. throughout the day, and extra trains are run as the attendance requires. There have been occasions on which it has been necessary to operate as many as 24 extra trains in one day. The latest timetable represents an increase of approximately 12 per cent in the number of trains operated, although, on the basis of cars operated, the expansion is about 50 per cent.

Western railroads are using the Columbia radio broadcasting network each

Monday and Thursday nights at 7:45 p.m. to emphasize the comfort, convenience and economy of traveling to the Century of Progress Exposition at Chicago by train, and featuring the all-expense tour, reduced railroad and Pullman fares, convenient stopovers, etc. The program includes an orchestra, a quartet and a short dialogue between a man and a woman who plan to attend the World's Fair and who are looking for the best form of transportation. This program will be continued on each Monday and Thursday until August 3.

A survey made by the Transportation division of the Fair shows that the patronage of the various forms of transportation within the city to the Fair figures out as follows: Elevated lines, 3.7 per cent; railroads, 14.5 per cent; bus lines, 17.6 per cent; street car lines, 19 per cent; and private automobiles or by foot, 40 per cent.

New York City Holiday Traffic

Both the New York Central and the Pennsylvania carried an unusually heavy passenger traffic out of New York on July 1-3 and into the city following Tuesday, July 4, the Independence-Day celebration combining with the usual Saturday-Sunday movement to make a four-day holiday. In addition to this, there was a heavy movement, prior to the holiday, to Chicago. In long-distance travel many movements were the highest on record, though for shorter distances the crowds were diminished somewhat on Monday, July 3, by unusually cool weather.

On the Pennsylvania the regular summer rush began on June 27, when there was a large movement to northern New England, the Bar Harbor Express running heavy for several days. On Friday, June 30, there were 10 separate trains for Maine points, three of these originating at Washington. The Montrealer also had heavy loads for Vermont and Canada running in two and three sections for several days.

The Pennsylvania dispatched to Chicago and the west on July 1 about 75 extra sleeping cars. For the four days, Friday-Monday, the Pennsylvania station, New York, dispatched altogether about 225 sleeping and 100 parlor cars above the normal number.

The New York Central, in addition to the usual holiday traffic, largely of a local nature, carried large numbers to Chicago. On Saturday the Exposition Flyer, to Chicago ran in five sections, and three other through trains consisted of four sections each. Trains of two or three sections were too numerous to mention.

Counting on the basis of extra cars used, the traffic incidental to the fourth of July amounted to about 13,000 cars, in two days, this year, as compared with 9100 cars in the comparable two days last year. This road, like the Pennsylvania, carried large numbers of boys and girls to northern summer camps.

The Grand Central Terminal, on the heaviest days, sent and received about 725 trains, including those of the New York, New Haven & Hartford. The latter road and the New York Central together took out about 15,000 boys and girls for 287 summer camps.

Supply Trade

The **Sullivan Machinery Company,** Chicago, Ill., has combined its St. Louis district sales office and its Mt. Vernon, Ill., warehouse, the combined facilities now being located at 2639-41 Locust avenue, St. Louis, Mo.

W. L. Garland, vice-president, **Safety Car Heating & Lighting Company,** with headquarters at Philadelphia, Pa., resigned on July 1. Mr. Garland retires from a long and active business career to join his family in Arizona, where his son is engaged in the ranching business.

The General American Transportation Corporation, Chicago and New York, has taken over the refrigerator car operations of the Missouri-Kansas-Texas and in future the entire refrigerator requirements of this road will be supplied exclusively by the General American. This will add 3,188 miles to the latter company's refrigerator car lines, bringing the total mileage to 31,684.

Arrangements have been concluded whereby the **American Chain Company** (Bridgeport, Conn.) **and associate companies** will take over the drawing, fabricating and sale of Allegheny Metal and other Allegheny alloys in round, flat and shaped wire forms. This new wire will be marketed under the name of Page-Allegheny Alloys, and will be sold by the Page Steel & Wire Company, Monessen, Pa. In the plant of the Hazard Wire Rope Company, Wilkes-Barre, Pa., various forms of wire rope will be made from these alloys, and at the York, Pa., plant of the American Chain Company chains and chain attachments will be produced.

Charles W. T. Stuart has been appointed manager for the **Safety Car Heating & Lighting Company,** with headquarters at Philadelphia, Pa. He will assume the duties relinquished by William L. Garland. Mr. Stuart was born in Philadelphia in 1888, educated in the public schools of Philadelphia, and Drexel Institute. He entered the service of the Baldwin Locomotive Works in 1908, and in 1909 he joined the motive power department of the Pennsylvania, resigning in 1924, to become the sales representative for the Safety Car Heating & Lighting Company, at Philadelphia. While with the Pennsylvania he specialized particularly in electric lighting equipment for steam railway cars, and contributed many articles on car lighting subjects to railway publications, among them being a series in the Railway Electrical Engineer on the fundamental principles of car lighting. Mr. Stuart is the author of the "Hinky Dee" stories which appeared anonymously in the Railway Electrical Engineer throughout 1919 and 1920. This series of stories created a great deal of favorable comment and speculation concerning their authorship. He also is the author of Carlighting By Electricity published in 1923, which was the first complete volume covering this subject.

C. W. T. Stuart

At a meeting of the board of directors of the **Maloney Oil & Manufacturing Company,** Scranton, Pa., on June 23, the following officers were elected: **L. Carberry Ritchie,** president; **Walton R. Collins,** vice-president; and **James M. Collins,** formerly assistant treasurer, treasurer. **M. M. Tinsley** was re-elected as assistant to the president. The company at this time announced a new line of emulsified asphalts for various industrial uses, including Industrial Mastic Flooring, Aquaseal, Roofcote, Fibur-Mastic, Weatherseal, Sealtite, Tilecet and Masticet which will bear the name "Collins," in honor of Maurice W. Collins, former president and treasurer of the company, and one of its founders. In addition the company handles the emulsified products of the Headley Emulsified Products Company for which the Maloney Oil & Manufacturing Company has exclusive sales rights among the railways. Walton R. Collins, the new vice-president, will be in charge of sales; he was born on October 29, 1897, at Scranton, Pa., and received his higher education at Bank's Business College, Philadelphia, Pa. He became associated with the Maloney Oil & Manufacturing Company in 1918 as manager of its Wilkes-Barre plant. In 1920 he left the company to enter the banking business at Scranton. In the fall of 1925, Mr. Collins returned to the Maloney Oil & Manufacturing Company as sales rep-

Walton R. Collins

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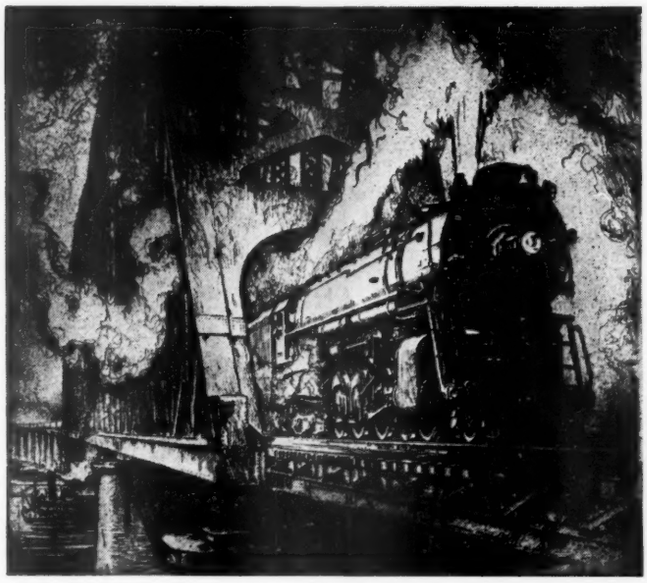

GET THE MAXIMUM RETURN *from* PERMANENT IMPROVEMENTS

WITHIN the last few years, hundreds of millions of dollars have been wisely spent in improving track structures, yards, signals, thus preparing the railroad for intensive operation. ● To earn the maximum return on these investments, Super-Power Steam Locomotives have repeatedly shown their ability to haul 50% more tons at a third higher speed than the average freight engine now in service. ● New power is essential to improve transportation.

LIMA LOCOMOTIVE WORKS

INCORPORATED

LIMA LIMA LOCOMOTIVE WORKS INCORPORATED OHIO

resentative and assistant to his father, M. W. Collins. He continued in this capacity until his recent election as vice-president. Mr. Collins is chairman of the Signal Appliance Association.

OBITUARY

Alexander D. Gillis, founder of Gillis & Co., Chicago, died in that city on July 11. He was born in Green Bay, Wis., in 1859, and started his business career with the Chicago & North Western, rising to the position of assistant division superintendent, from which position he resigned because of ill-health. After an extended period of convalescence, he entered the employ of the Illinois Steel Company, taking charge of water and rail traffic. In 1892 he opened an office in Chicago under the firm name of Gillis & Co., specializing in cargo shipments of cedar ties, and remained active in the firm until January, 1932, when he retired.

Charles E. Lee, formerly general superintendent of the Boston & Maine, died at a hospital at Springfield, Mass., on July 6. Mr. Lee was born August 19, 1860, and was educated in the public schools. He began railway work in 1877, and served as operator of the Boston, Clinton, Fitchburg & New England (now part of the N. Y. N. H. & H.). From 1879 to December, 1896, he was operator and train dispatcher on the Worcester, Nashua & Rochester and then on its successor the Boston & Maine. He served as division superintendent of the Boston & Maine until August, 1903, when he was appointed assistant general manager and in September, 1906, was promoted to general superintendent of the same road. Mr. Lee resigned from the B. & M. in September, 1912, to become general manager of the Commercial Acetylene Company, New York. For several years prior to 1923 he made special transportation studies and reports for various interests and since that time maintained headquarters at New York as special consultant.

Equipment and Supplies

LOCOMOTIVES

THE DRAPER CORPORATION, Beebe River, N. H., has accepted delivery from the Fate-Root-Heath Company of a 30-ton Model M L 6 standard gage locomotive, to use gasoline as fuel.

FREIGHT CARS

THE CUDAHY PACKING COMPANY has ordered 200 car sets of underframe material from the Pullman Car & Manufacturing Corporation.

THE ETHYL GASOLINE CORPORATION has ordered 12 special tank cars from the General American Transportation Corp. These will consist of six cars of 3,000-gal. capacity and six of 6,000-gal. capacity to be used for carrying Ethyl fluid.

THE SHAWINIGAN PRODUCTS CORPORATION, Shawinigan Falls, Canada, has ordered three aluminum tank cars of 8,000-gallon capacity, from the General American Transportation Corporation. These cars will be used to haul glacial acetic acid used in the manufacture of long-fiber rayon.

IRON AND STEEL

THE MISSOURI-KANSAS-TEXAS has ordered 120 tons of structural steel for miscellaneous bridge work from the American Bridge Company.

BRAZIL.—A contract has been given to the United States Steel Products Company for 38,000 tons of steel rail and accessories, to be exported to Brazil.

THE MISSOURI PACIFIC has ordered 1,760 tons of structural steel for miscellaneous bridge work from the American Bridge Company.

THE GRAND TRUNK has ordered 170 tons of structural steel for grade separation work at Detroit, Mich., from the American Bridge Company.

THE KANSAS CITY SOUTHERN has placed a contract with the Kansas City Bridge Company for the fabrication and erection of three 80-ft. girder spans to replace a 250-ft. truss span across Little river near Morris Ferry, Ark.

THE NEW YORK CENTRAL has ordered about 17,000 tons of steel for its elevated structure between Clarkson and Eighteenth streets, New York City. The contract for the steel was divided between the American Bridge Company, which received about 5,000 tons, and the Fort Pitt Bridge Works about 12,000 tons. Post & McCord, subcontractors, will do the erecting work. James Stewart & Company, Inc., has the general contract.

CANADIAN NATIONAL.—An order for 30,000 tons of rail to be rolled to Canadian National specifications has been given to the Algoma Steel Corporation at Sault Ste. Marie, Ont. This is being carried out in accordance with the Relief Act of 1933 whereby the government will guarantee interest of 5 per cent upon money borrowed by the Steel Corporation to finance the filling of the contract. In the *Railway Age* of June 17 an order for 50,000 tons of rail placed under similar conditions was reported.

Railway Equipment Maintenance Operations Are Being Speeded Up

Steadily increasing freight traffic makes imperative improvement in condition of cars and locomotives

For eight consecutive weeks up to July 1, freight car loadings for 1933 have surpassed those of the corresponding weeks in 1932. Car loadings for the week ended July 1 were 29.9 per cent greater than for the corresponding week in 1932. There are many indications that this improvement will continue.

What is being done to insure that the cars and locomotives will be in condition to meet these increased demands? The *Railway Age* on July 6 sent the following telegram to the presidents of Class 1 roads: "Appreciate greatly information extent you are enlarging locomotive and car repair programs, including location shops involved, number of employees added, etc."

Those replies giving concrete information are summarized below. Many other roads indicated that they were watching conditions closely and were prepared to take steps to meet any demands which might be made upon them.

Alton Railroad.—On June 26 the working time of the 330 employees in the Bloomington locomotive repair shop was increased from four to five days per week. Sixty-five additional men were employed on Monday, June 10.

Atchison, Topeka & Santa Fe.—On July 1 the working time was increased from three to four days per week in the locomotive repair shops at La Junta, Colo., employing 171 men; Albuquerque, N. M., employing 377 men, and San Bernardino, Cal., 485 men. The working time for both the car and locomotive forces at Cleburne, Tex., was increased from two to three days per week; 176 men are employed in the locomotive shop and 211 in the car shop at that point.

Baltimore & Ohio.—Beginning June 26, three hundred and thirty men went to work in the Mount Clare locomotive repair shop and 200 car men were called back to work for light repairs on freight equipment at various points on the system.

Central of Georgia.—Since June 1 the employees in the locomotive and car repair shops at Macon, Ga., have worked 45 hours instead of 32 hours per week. Employees at the Savannah coach shops have been working 45 hours per week as compared to 25.

Chicago & Eastern Illinois.—The locomotive repair shop at Danville, Ill., was closed last February, but was reopened in May and now employs 274 men; this is the normal force for the present volume of business. The car repair forces are being maintained on a basis commensurate with the present volume of business.

Chicago & North Western.—There has been a slight increase in the forces at the various car repair points. If business continues to increase it is anticipated that it will be necessary to add on August 1 a total of 400 men in the locomotive repair

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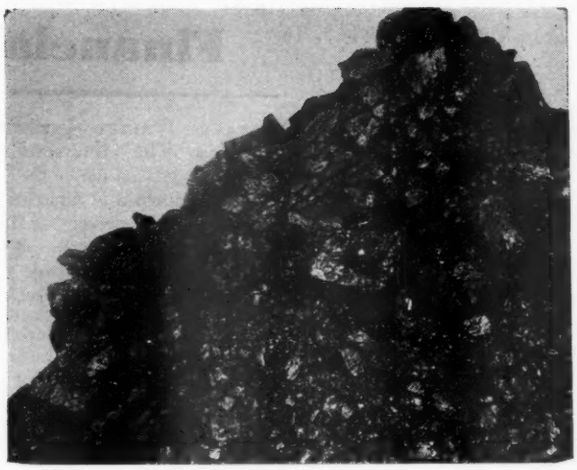
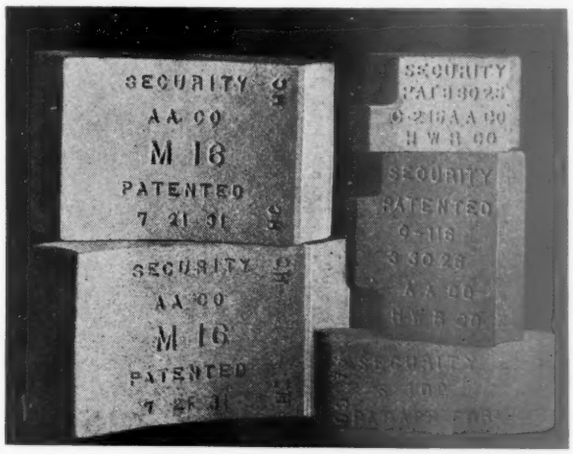


$10.00 *more must be spent for fuel for each* $1.00 *"saved" in Arch Brick*

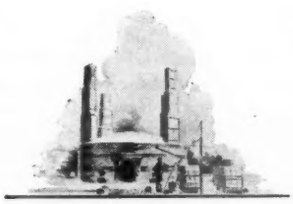


ONLY A *Complete* ARCH GIVES MAXIMUM FUEL SAVING

RIGID economy is directed towards the elimination of wastes and saving of every unnecessary dollar of expense.

But if the railroad is to operate it must buy such things as fuel and Arch Brick. If Arch Brick is skimped, then more fuel must be purchased—not dollar for dollar. Ten dollars more must be spent for fuel for each dollar "saved" in needed Arch Brick.

For full fuel economy you need a full Arch with every brick in place. That is the most effective way to economize in ultimate expense.



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HARBISON-WALKER REFRACTORIES CO.

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departments of the Chicago & North Western and the Chicago, St. Paul, Minneapolis and Omaha.

Chicago, Milwaukee, St. Paul & Pacific.—The July payrolls for the locomotive and car repair departments will be approximately seven per cent greater than in May.

Elgin, Joliet & Eastern.—Since May 1 the forces in the locomotive and car departments at Joliet, Ill., have been increased approximately 300, while about 150 have been added to the forces at Gary, Ind.

Erie Railroad.—Beginning July 1, the schedule for the locomotive shops at Hornell, N. Y., and Meadville, Pa., has been stepped up from 8 to 18 days per month. Prior to June 1 the car repair shops at Port Jervis, N. Y., Dunmore, Pa., and Huntington, Ind., worked 8 days per month. During the month of June the schedule at Port Jervis and Huntington was increased to 15 days per month, and beginning July 1 all the above shops have been placed on an 18-day per month schedule. Compared with the 8-day schedule, this represents an increase of 125 per cent in man-hours; 1,700 employees will be benefited.

Grand Trunk Western.—The working time has been increased at the Battle Creek, Mich., locomotive repair shops and the Port Huron, Mich., car repair shops.

Great Northern.—On Monday, July 10, the shops were opened at Hillyard, Wash., employing 235 men; St. Cloud, Minn., 156 men; and both the locomotive and car shops at St. Paul, Minn., employing 457 men.

Illinois Central.—The working forces have been increased by approximately 150 in the locomotive department and 265 in the car department.

Louisville & Nashville.—During the past 60 days increases in the shop forces have been authorized as follows: Locomotive repair department, Louisville, Ky., 153; Corbin, Ky., 51; DeCoursey, Ky., 13; Radnor, Tenn., 15; Seibert, Ala., 44. Car repair department, Louisville, Ky., 40; Corbin, Ky., 78; DeCoursey, Ky., 35; and Boyles, Ala., 66.

Missouri-Kansas-Texas Lines.—Since April approximately 800 employees have been put to work in the shops at Parsons, Kan., Waco, Texas, and Sedalia, Mo. The locomotive and passenger car repair programs so far this year have been greatly in excess of those for all of last year. The management is hopeful that increased business will necessitate the continuance of this repair program.

New York Central Lines (including the P. & L. E. and I. H. B.).—The locomotive and car maintenance forces were at a minimum in March, 1933; during that month eight locomotive repair shops operated a total of 93 days, with 2,844 men, or an average of 11.6 days per shop. In July, nine locomotive shops will operate a total of 140 days, an average of approximately 16 days per shop, and employing a total of 4,080 men. In the month of March three freight car repair shops worked a total of 15 days, or an average of five days per shop, 291 men being employed. In July four shops will operate a total of 78 days, or an average of a little more than 19 days per shop, 1,448 men being employed. Two passenger car repair shops worked a total of 20 days in March, or an average of 10 days each, 367 men being employed. In July, three passenger car repair shops will operate a total of 53 days, or a little better than 17 days per shop, 822 men being employed. The total number of shops operating in March was therefore 13, as compared to 16 in July, and the number of employees has been increased from 3,502 to 6,350.

Norfolk & Western.—On July 1 the working time of approximately 7,000 employees in all shops was increased from three to four days per week.

Pennsylvania Railroad.—The policy with the upturn in business is to immediately restore the maintenance program for both track and equipment. The locomotive repair program affects Altoona, Pa., and Columbus, Ohio, so far as class repairs are concerned, and for running repairs is generally distributed over all the enginehouses on the system. The class repair program on freight cars affects Altoona, Harrisburg and Pitcairn, Pa., and Terre Haute, Ind. Practically all division centers of light repair points are affected by the increase in light running repairs. An effort is being made to distribute the work over the system as much as possible.

Reading Company.—Three hundred and thirty-nine men have been added to the shops at Reading, St. Clair and Wayne Junction, Pa.

Rock Island Lines.—On July 5 the shops were opened at Silvis, Ill., Horton, Kan., and Shawnee, Okla. They will operate five days a week and include a working force of 1,140 men.

St. Louis Southwestern.—During the past month a substantial increase has been made in the freight car repair program.

Southern Pacific Company.—About June 1 the working week was increased from three to five days. The following shops were affected: Sacramento, Cal., locomotive department, 581 men, freight car department, 106 men, passenger car department, 294 men; Los Angeles, Cal., locomotive department, 706, freight car department, 157, passenger car department, 141; Bayshore, Cal., locomotive department, 356, freight car department, 218, passenger car department, 103. This order also included the freight car repair departments at Oakland, Cal., 153 men; Roseville, Cal., 51 men; Bakersfield, Cal., 25 men; Dunsmuir, Cal., 14 men; Klamath Falls, Ore., 14 men; Eugene, Ore., 33, and Taylor, Cal., 68 men.

NEW TIME SCHEDULES of the Railway Express Agency air service have recently been put into effect to more closely co-ordinate express-plane arrivals and departures with fast trains on railroads centering at the principal airports on the 12,500-mile Railway Express Agency air-transport system. Pacific Coast cities off the air routes are now reached from New York in less time by air-and-rail express than the major airports of that area were made by direct air schedules a short while ago.

Financial

ARKANSAS VALLEY INTERURBAN.—*Reorganization.*—The Interstate Commerce Commission has added the names of Warren E. Brown and Charles H. Smyth, of Wichita, Kan., receivers of this property, to its panel of standing trustees from which appointments may be made by federal courts in reorganization cases.

BOSTON & MAINE.—*Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue $16,500,000 of short term notes to pay or renew obligations to banks, the Reconstruction Finance Corporation and the Railroad Credit Corporation maturing this year.

CHESAPEAKE BEACH.—*R. F. C. Loan Denied.*—The Reconstruction Finance Corporation has denied this company's application for a loan of $425,000, to be used in constructing a new ferry across Chesapeake Bay, which had been conditionally approved by the Interstate Commerce Commission.

CHICAGO, BURLINGTON & QUINCY.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon branch lines from Osceola, Ia., to Van Wert, 11.13 miles, from Decatur City, Ia., to Leon, 6.53 miles, and from Englewood, S. D., to Spearfish, 31.54 miles.

CHICAGO, ROCK ISLAND & PACIFIC.—*Reorganization.*—Charles Hayden, chairman of the board of this company, has announced that a plan for reorganizing the company under the new federal bankruptcy law is in course of preparation. No deposit of securities has been requested, since approval of the plan by the Interstate Commerce Commission will be sought first, before assent thereto by security holders will be asked.

GREAT NORTHERN.—*Refinancing.*—The largest refinancing of railway securities since 1929 without assistance from the Reconstruction Finance Corporation has been consummated by the Great Northern in connection with $43,000,000 of bonds of the St. Paul, Minneapolis & Manitoba. Holders were asked to extend the maturity for a period of ten years, the First National Bank of New York advancing funds to pay those who did not agree to the extension. Before these arrangements could be concluded, it was necessary to obtain the consent of a majority of the holders of the railway's first and refunding bonds, and holders of more than 98 per cent of these bonds assented to the extension of the prior lien.

ILLINOIS TRACTION, INC.—*Abandonment.*—This company and the Illinois Terminal Company have applied to the Interstate Commerce Commission for authority to abandon branch lines from Hillsboro, Ill., to Litchfield, 7.8 miles, and from Ridge Farm to Georgetown, 5.01 miles.

JEFFERSON & NORTH WESTERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to

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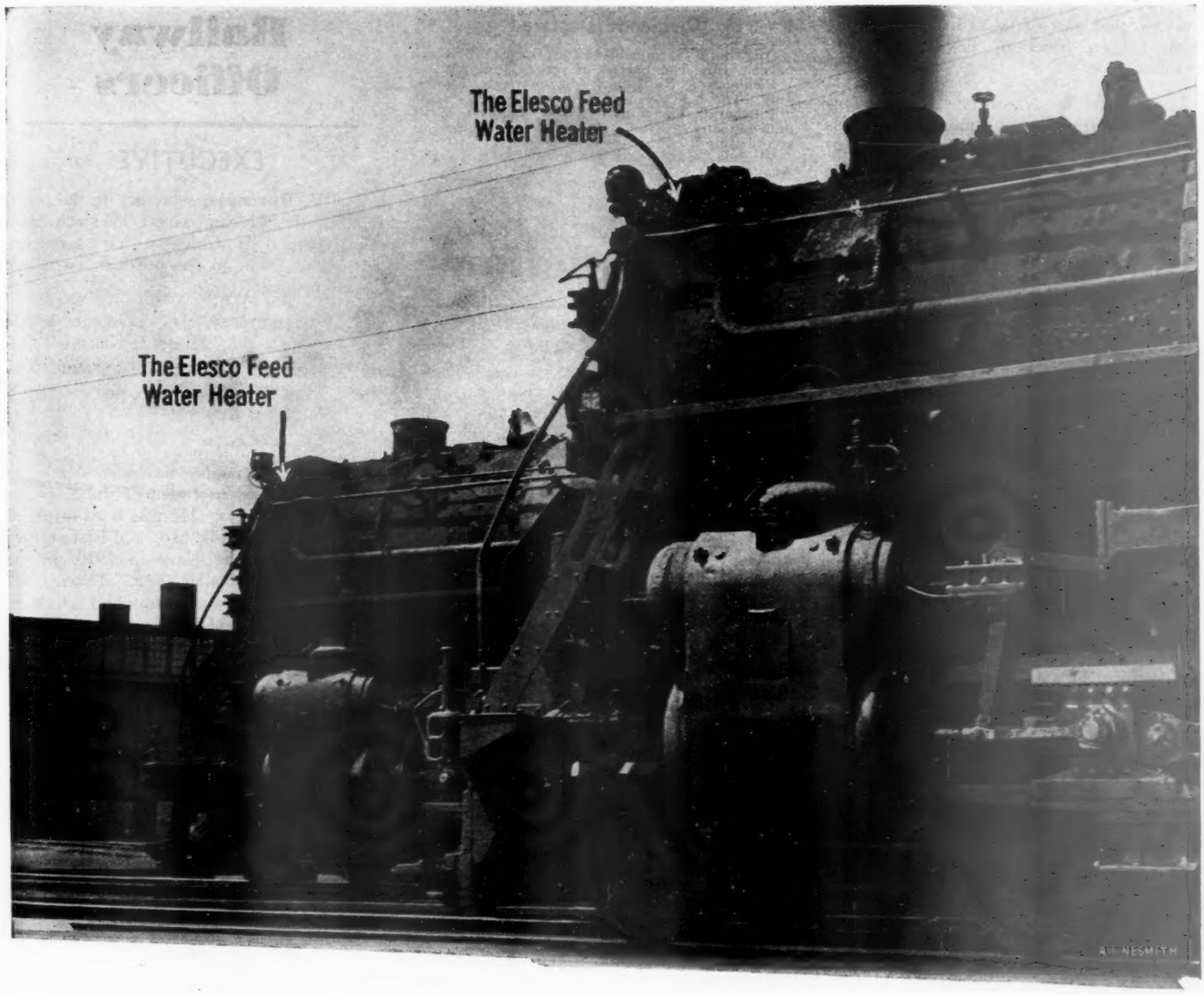

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Save Locomotive Fuel

Take 12 to 15 per cent of the cost of the fuel consumed by the locomotives on your railroad without feed water heaters, and you have the amount that Elesco feed water heaters can save in your fuel bill.

This saving is direct and positive, because Elesco feed water heaters reclaim heat from part of the exhaust steam that otherwise goes out the stack as waste . . . . . equivalent to 12 to 15 per cent of the total fuel consumption.

Developed for the requirements of modern railroading and proved by thousands of installations, Elesco feed water heaters are pointing the way to substantial fuel savings.

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abandon that part of its railroad extending from Linden Junction, Tex., to Naples, 29 miles.

LOUISVILLE & NASHVILLE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon that part of its Red Gap branch extending from Graces, Ala., to Hedona.

PENNROAD CORPORATION.—*Purchase of P. & W. V. Investigated By Senate Committee.*—Frank E. Taplin, president of the Pittsburgh & West Virginia, H. H. Lee, president of the Pennroad, and A. J. County, vice-president of the Pennsylvania, were called to testify before the Senate committee on banking and currency on July 6 and questioned by Ferdinand Pecora, its counsel, as to details of the transaction by which the Pennroad in September, 1929, purchased 222,930 shares of the stock of the P. & W. V. from Mr. Taplin and associates for $170 a share. Mr. Taplin testified that he and associates had purchased a majority of the stock of the P. & W. V. several years before with the purpose of improving its earning capacity and then selling it to one of the eastern trunk line systems and that he had for two or three years discussed with officers of the Pennsylvania a sale of the stock, for which he wanted $200 a share. The Pennsylvania officers considered this too high, he said, but in the fall of 1929, foreseeing a financial storm, he had arranged for the sale to the Pennroad, without any written agreement. Mr. Lee testified that he had not known of the purchase until after it had been made because he was away on a vacation.

RED RIVER & GULF.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon operation under trackage rights over a railroad extending from the terminus of its line at Louisiana Junction, La., to Cocodrie, 7 miles.

ST. LOUIS-SAN FRANCISCO.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and its receivers to abandon a branch line extending from North Jennings, Okla., to Jennings, 1.8 miles.

SEABOARD AIR LINE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and its receivers to abandon 5 miles of the westerly end of its Starke-Wawnee branch in Florida.

UNION PACIFIC.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon three branch lines in Kansas, from Knox to Clay Center, 143.15 miles; from Clay Center to Concordia, 35.81 miles, and from Lawrenceburg to Belleville, 17.15 miles. It is proposed to operate over the Atchison, Topeka & Santa Fe between Miltonville and Concordia, 20.06 miles, under a trackage agreement.

Average Prices of Stocks and of Bonds

	July 11	Last week	Last year
Average price of 20 representative railway stocks..	49.39	48.81	12.25
Average price of 20 representative railway bonds..	73.76	71.79	48.70

Dividends Declared

Augusta & Savannah.—$2.50; Extra, 25c, both payable July 5 to holders of record June 15.

Piedmont & Northern.—75c, quarterly, payable July 10 to holders of record June 30.

Pittsburgh, Cincinnati & St. Louis.—$2.50, semi-annually, payable July 20 to holders of record July 10.

Virginia.—Preferred, $1.50, quarterly, payable August 1 to holders of record July 15.

Construction

BALTIMORE & OHIO.—The New York Public Service Commission has ordered the reconstruction of the bridge carrying this road over the Alexander-Canawaugus county highway in Pavilion, Genesee county, N. Y. The estimated cost of the reconstruction is $26,512.

CHESAPEAKE & OHIO.—This company plans to rehabilitate the elevators in two of its warehouses and pave the area around the buildings at Norfolk, Va., at a cost of about $40,000. A contract has been given to the Dravo Contracting Company to rebuild a portion of bridge No. 11 over Mill creek at Cincinnati, Ohio, at a cost of about $153,500.

ELGIN, JOLIET & EASTERN.—A contract has been awarded the Powers-Thompson Company, Joliet, Ill., for the substructure work on a double track bridge over the DesPlaines river at Joliet. The railroad has also awarded a contract for the substructure work on a single track bridge with a lift span of 152 ft. over the Illinois waterway at Divine, Ill., to the Walsh Construction Company, Davenport, Iowa.

LEHIGH & HUDSON RIVER—NEW YORK, NEW HAVEN & HARTFORD.—The New York Public Service Commission has directed the elimination of four grade crossings in the village of Maybrook, Orange county, N. Y. Some of the crossings are to be eliminated by closing the highway across the right of way of the railroad and constructing pedestrian subways. There will be a structure over the New Haven tracks with a clearance of 22 ft. above the rails and a structure over the Lehigh & Hudson River tracks also to have a clearance of 22 ft. The estimated cost is about $200,000, including land and property damages.

MISSOURI PACIFIC.—This road has undertaken the reconstruction of its bridge across the flood control channel of the St. Francis river at Fisk, Mo., approximately one-third of which will be reconstructed this year. This bridge is a pile trestle structure about 2,600 ft. long, which will be replaced by I-beam spans on concrete piles.

ST. LOUIS-SAN FRANCISCO.—United States District Judge Charles B. Faris at St. Louis, Mo., has authorized this company to expend $495,077 for improvements to its property during the last half of the year. The work will include the laying of 110-lb. rail on 25 miles of main line to replace 90-lb. rail, at an estimated cost of $238,220, and a bridge and trestle program amounting to $202,585.

Railway Officers

EXECUTIVE

H. W. Burtness, secretary to the president of the Chicago Great Western, with headquarters at Chicago, has been appointed assistant to the president with the same headquarters.

J. F. Hennessy, Jr., passenger traffic manager of the Missouri-Kansas-Texas lines, with headquarters at St. Louis, Mo., has been appointed to the newly-created position of assistant to the president, with the same headquarters, and the position of passenger traffic manager has been abolished. Mr. Hennessy has been connected with the traffic department of the Katy for more than 20 years. He was born on April 11, 1893, at St. Louis, Mo., and first entered the service of the Katy in 1910, in the freight office at Dallas, Tex. Three years later he was advanced to chief clerk to the assistant general freight agent at Houston, Tex., and in the following year he was made contracting agent at Houston. During the World War he served as a captain in the 344th Machine Gun Battery and also with the Army of Occupation. He returned to the Katy in 1920 as division freight agent at Austin, Tex., and later served in the same position at Houston. In 1926 he was advanced to assistant general freight agent at Houston and later in the same year he was transferred to Dallas. He was then advanced to general freight agent at St. Louis, where he was promoted to executive general agent on June 1, 1929. Two years later Mr. Hennessy was promoted to passenger traffic manager at St. Louis, which position he continued to hold until his recent appointment as assistant to the president.

J. F. Hennessy, Jr.

FINANCIAL, LEGAL AND ACCOUNTING

Sir Gordon Johnson, registrar, auditor of agencies department of the Canadian Pacific, retired on pension June 30, after more than 30 years service with that road.

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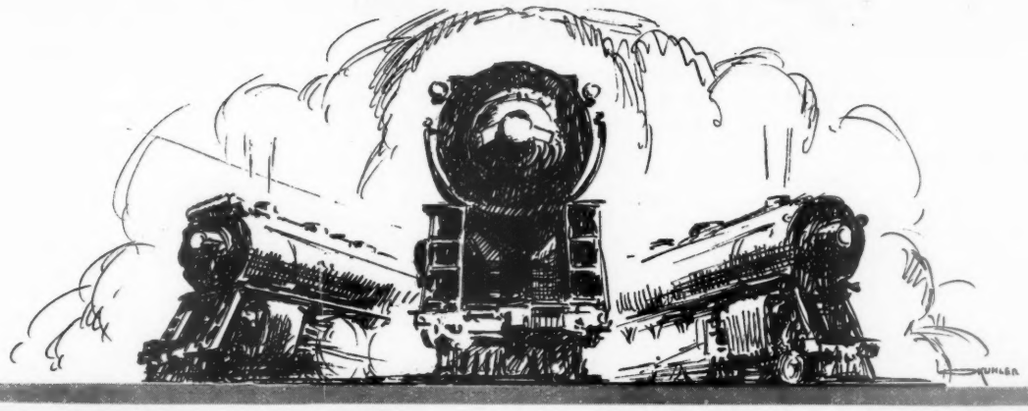

Frank N. Hallstead, general paymaster of the Delaware, Lackawanna & Western at Scranton, Pa., retired effective July 1. Mr. Hallstead has been in the continuous service of the Lackawanna for the past 53 years.

Charles A. Murray, western tax attorney for the Northern Pacific, with headquarters at Seattle, Wash., has retired under the pension rules of the railway. He entered the employ of that company on May 10, 1908.

TRAFFIC

G. F. Buckingham has been appointed chief of tariff and division bureau of the Canadian Pacific, with headquarters at Montreal, Que.

T. C. Andrews, who has been connected with the General American Transportation Company, has been appointed to the newly-created position of general agent for the Litchfield & Madison, at Tulsa, Okla.

E. A. Klippel, Jr., assistant general passenger agent for the Union Pacific System, at Salt Lake City, Utah, has been appointed general agent, passenger department, with the same headquarters, succeeding **D. S. Spencer,** general passenger agent, who has retired.

L. R. Lawson, assistant general freight agent of the Piedmont & Northern, has been appointed general freight and passenger agent succeeding **W. I. Rankin,** promoted. Mr. Lawson will have headquarters at Greenville, S. C., as before. The position of assistant general freight agent at Greenville and general agent at Spartanburg, S. C., have been abolished.

D. L. Carter, assistant general freight agent on the Missouri Pacific, with headquarters at Little Rock, Ark., has been appointed assistant general freight and passenger agent at Detroit, Mich., effective August 1, to succeed **L. M. White,** general agent, who will retire on that date. **H. D. Reaves,** division freight and passenger agent at Monroe, La., has been appointed assistant general freight agent at Little Rock to succeed Mr. Carter.

W. I. Rankin, general freight and passenger agent of the Piedmont & Northern, has been appointed freight traffic manager of that road and the Durham & Southern, with headquarters at Greenville, S. C., as before. Mr. Rankin is a native of Mount Holly, N. C., and entered the service of the P. & N., as an office boy at that point. In March, 1916, he was appointed agent at Mount Holly and later served in the same capacity at Spartanburg, S. C., where he remained until early in 1918, when he was given leave of absence to enter the World War. After the war he returned to the Piedmont & Northern as agent at Charlotte, N. C., and on September 1, 1922, he was advanced to commercial agent at Anderson, S. C. Three years later he was transferred to Charlotte, in the same capacity, and on November 1, 1925, he was promoted to general freight and passenger agent at Greenville, the position he held until his recent promotion.

ENGINEERING AND SIGNALING

R. H. Crew, assistant division engineer of the Cincinnati division of the Pennsylvania, with headquarters at Richmond, Ind., has been promoted to division engineer of the Indianapolis division, with headquarters at Indianapolis, Ind., to succeed **J. M. Fox,** who has been transferred to the Baltimore division, with headquarters at Baltimore, Md. The position of assistant division engineer at Richmond has been abolished.

MECHANICAL

D. J. Mullen and **J. A. Brossart,** superintendent of motive power and superintendent of rolling stock, respectively, of the Cleveland, Cincinnati, Chicago & St. Louis, have had their headquarters moved from Indianapolis, Ind., to Cincinnati, Ohio.

SPECIAL

Miles C. Kennedy, who has been appointed executive secretary of the Eastern Regional Co-ordinating Committee, with headquarters at New York, was born at Beaver Falls, Pa., on February 12, 1893, and received his education at Geneva College, Beaver Falls, and Yale College (A.B. 1915). Mr. Kennedy began railroad work on June 15, 1916, as transitman on the location of the Gulf, Mobile & Northern from Middleton to Jackson, Tenn., and was later resident engineer on a portion of the construction. After military service in the World War Mr. Kennedy re-entered railroad work with the Texas, Oklahoma & Eastern as assistant engineer. At the same time he also served in a similar capacity for the Dierke Lumber & Coal Company at DeQueen, Ark. From 1922 to 1927, he served in the engineering department of the Pennsylvania at Pittsburgh, Pa. From 1927 to February, 1932, he was on the staff of the Coverdale & Colpitts, consulting engineers, in which connection his work dealt largely with railroad matters. From February 7, 1932, to June 1, 1933, Mr. Kennedy was chief examiner, railroad division, Reconstruction Finance Corporation.

OBITUARY

R. D. Stewart, who retired in 1927 as chief engineer of the Denver & Salt Lake, with headquarters at Denver, Colo., died on June 28 at Denver.

Edwin Gould, senior vice-president of the St. Louis Southwestern, died at his home in Oyster Bay, N. Y., on July 12. Mr. Gould was born in 1866 and entered railway service in 1888 with the St. Louis, Arkansas & Texas and held that position until that road was reorganized as the St. Louis Southwestern in 1891, when he was elected a vice-president of the new company. From 1898 to 1912 he was president of this company, and from the latter year until 1926 he was chairman of its board of directors. In that year he relinquished the chairmanship and was elected senior vice-president, which position he had at the time of his death.

Edward D. Ainslie, general passenger agent of the Baltimore & Ohio at New York, died suddenly on July 4, at the Long Island College Hospital, Brooklyn, N. Y. Mr. Ainslie was born at Sandusky, Ohio, on April 19, 1875, and entered railroad service in May, 1892, as assistant ticket agent of the B. & O. at New York. Later he was promoted to ticket agent, and from July, 1911, to February, 1917, he served as passenger and ticket agent at Brooklyn, N. Y. In 1917, he was appointed district passenger agent and the following year he was transferred to Baltimore, Md., as agent in the consolidated ticket office there. In March, 1920, he was advanced to assistant general passenger agent at St. Louis, Mo., and in November, 1927, he became assistant general passenger agent at Washington, D. C. Mr. Ainslie was appointed general passenger agent at New York in January, 1929, in which capacity he served until his death.

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Along the Chicago, Burlington & Quincy in Sheep Canyon, Big Horn Basin, Wyoming